

AN ASSESSMENT OF PATIENT EXPERIENCE AND PATIENT PERCEIVED PERFORMANCE OF PROSTHESIS SUPPORTED OR RETAINED WITH DENTAL IMPLANTS: AN AMBISPECTIVE STUDY

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ABSTRACT:

Backgrounds and Aim: This ambispective study aimed to systematically assess patient-reported outcomes, level of satisfaction, and the specific biological and mechanical complications associated with dental implants and implant-supported restorations performed in an institutional setting. **Materials and Methods:** Departmental records from the dental institute were screened to identify patients who received implant-supported or retained restorations (single crowns, fixed partial dentures [FPDs], or full-arch prostheses) between 2020 and 2025. To evaluate patient-perceived success, satisfaction, and functional outcomes—including mechanical and prosthetic complications—A structured telephonic interviews were conducted with all participants. Prior to these evaluations, an information document detailing the research objectives, alongside a written informed consent form, was mailed via prepaid registered post to each subject's recorded home address. Participants reviewed the materials, executed the consent documentation, and mailed the signed forms back to the department in the provided prepaid return envelope.

Results: Evaluating 102 patients revealed the posterior mandible as the primary site of implant placement, accounting for 48.3% of all cases. Participant satisfaction was high, with 80.3% reporting no functional or clinical issues throughout the follow-up period. Prosthetic complications were significantly more prevalent than definitive implant failures (5.88% of total interventions). Patient-reported outcomes varied according to the type of implant-supported prosthesis. represents in terms of absolute numbers, single crowns accounted for the highest volume of prosthetic complaints (n = 10, 18.86% of total sample complaints) compared to full-arch prostheses (n = 3) and FPDs.

Conclusion: This retrospective study evaluated patient-reported outcomes for implant and prosthetic treatments delivered at a university clinic. The main goals were to assess overall patient satisfaction, identify specific types of prosthetic complications, compare outcomes across different implant brands, and analyze whether complication rates varied among single crowns, fixed partial dentures (FPDs), and full-arch prostheses.

KEYWORDS: Dental implants, Patient satisfaction, Implant-supported prosthesis, Prosthetic complications, Patient-reported outcomes.

INTRODUCTION

Dental implants have become a regular and reliable way to replace lost teeth and provide a more comfortable, function and appearance than conventional bridges or dentures. Improvements in implant shapes and surface treatments as well as CAD/CAM restorative materials over the years have made these treatments even more reliable. Consequently, the placement of single crowns, bridges and even full-arch prostheses supported by implants are commonplace in everyday clinical practice.¹

But, the definition of success after implant has changed. Clinicians has concentrated on the survival of the implant, just looking to see if the metal post was still fastened in the jaw bone. Researchers differentiate between an implant that remains in place and a successful overall treatment today.² In 1986 Albrektsson et al. suggested criteria for implant success based primarily on clinical and radiographic results. As the concept of implant success has changed over time, contemporary evaluations have begun to include Patient-Reported Outcome Measures (PROMs) which more accurately represent the patient's experience and satisfaction with treatment.³ Patient satisfaction is affected by a variety of factors besides functional comfort. The success of treatment is a patient's perception and is heavily dependent on the ability to speak comfortably, esthetic appearance, and improvements in oral health-related quality of life (OHRQoL).^{4,5}

Despite the high success rates, there are still relatively frequent clinical complications.^{5,6} The complications of implant-supported prostheses can be divided into biological and technical ones. Biological complications are typically caused by peri-implant tissue inflammation, infection, and bone destruction, while technical complications are often related to

screw loosening, fracture of the prosthetic components or chipping of the ceramics or loss of implant retention.^{7,8,9} Many of the complications of a prosthesis require further chairside procedures and trips for repair or replacement. These interventions can impact the patient's treatment experience and can lead to decreased satisfaction.⁸

Technical complications occur, and this is important to differentiate from prosthetic survival, and several factors are responsible for this. The implant can work well in the bone, but the mechanical issues with the prosthesis may necessitate intervention. The implant/abutment design is a major factor for the success of prostheses. Since the flat seating geometry of the traditional internal hex connection allows the functional forces to be transmitted primarily through the abutment screw, this may make it more likely for the screw to loosen during repeated occlusal loads. By contrast, conical and Morse taper connections have a tapered fit between the implant component and abutment, allowing the components to grip each other in a frictional fit. The general style of the restoration (e.g., a single crown, multi-unit bridge or extensive full-arch prosthesis) affects the distribution of mechanical stress and affects the manner in which the components fail with time.⁹

Data on the implants over the long term are available from well controlled specialist clinics and private practice, but are not as well documented in systematic tracking in university dental programs. Tracking and understanding these institutional treatments is essential to gauge whether our success and complication rates are similar to the industry as most of our cases are treated by post graduate students under the supervision of trained faculty with varying experience.¹⁰

For this reason, a retrospective questionnaire-based study was developed to evaluate the success of dental implants and implant supported prostheses in a patient-centered retrospective study conducted in a university clinic. The main aims are to investigate the overall satisfaction of the patients, to estimate the actual reasons for the prosthetic intervention, to analyse the failure types of the different manufacturing systems used for the different types of implants, and to compare the distributions of the performance of the different types of prostheses; single crown, fixed partial denture (FPD) and full-arch prostheses, completed by postgraduate students, supervised by trained faculty.

MATERIALS AND METHOD

This ambispective study was conducted in the Department of Prosthodontics, Crown & Bridgework and Oral Implantology, Faculty of dental science, Dharmsinh Desai University and ethical approval was obtained from the Institutional Review Board, a written informed consent form, along with an information sheet explaining the purpose of the study were collected.

We used our departmental record system to identify eligible patients that had dental implants and restorations between 2020 and 2025. Patients had to agree to participate and have complete clinical records to be included. Any person with missing files, persons whose implant had failed prior to getting their prosthesis, or persons who refused to participate in the study were excluded.

Existing patient charts were used to collect information on implant type and restoration information. Patient experience was measured with a structured questionnaire asking about general satisfaction, chewing ability, stability of bridges/dentures, pain and previous hardware problems. After establishing that a patient was a candidate for a study, we used a standardized outreach protocol which involved mailing a consent form and information sheet via prepaid registered mail to a patient's residence.

After receipt of signed consent forms, the patients were called by telephone to verify their consent. The questionnaire was subsequently filled out in a telephone interview, with the investigator noting the answers. Participants were informed that their participation was voluntary, and that they could withdraw at any time from the study.

QUESTIONNAIRE FOR PATIENTS UNDERGONE IMPLANT SURGERY

Personal data:

1. Patient Name :
2. Patient case No :
3. Age :
4. Gender: Male/Female
5. Contact No: _____

Medical history:

6. Any systemic disease recorded?
Yes / No
If yes specify:

Implant/surgical details:

7. Implant placement date:
8. Implant site:
9. Implant brand [as recorded]:
10. Immediate implant placement? Yes/No
11. Prosthesis type placed on implant :-
Single crown: Zirconia / PFM / Metal.
FPD: PFM / Zirconia.
Full arch fixed: Metal acrylic/all ceramic/metal composite
Over denture: Acrylic / metal reinforced acrylic
12. Date of Prosthesis insertion? How many years have passed since prosthesis delivered?
13. When was the last clinical follow up done?
14. Is there any pain around the dental implant? Yes / No
15. Clinical mobility at follow up:
Yes / No
16. Any recorded signs of bleeding from the gums around the dental implant
Yes/No/Not recorded
17. Crowning ability improvement compared to Pre-op(scale):
Much worse(0)/Worse(1)/ same(2)/Improved(Much improved)

0 1 2 3 4

18. Any history of prosthesis dislodgement?
Yes/No
If yes How patient has replaced it or not?
19. Any history of prosthesis fracture while chewing or biting?
Yes/No
If yes then patient has visited dentist for same or not?
20. Would you recommend treatment with dental implants at our institute to others?
Yes / No / Not recorded

Figure 1: Questionnaire for patients undergone implant surgery and rehabilitated with prosthesis

Implant site of placement	N	%
Anterior mandible	20	9.9
Anterior maxilla	27	13.3
Posterior mandible	98	48.3
Posterior maxilla	57	28.2
Total	202	100

Table 1 : Distribution of implant site of placement in patients

OBJECTIVES

- To evaluate the survival and perceived success of dental implants.
 - To assess the success of implant-supported or retained prosthesis.
 - To evaluate patient satisfaction following implant therapy at the institute
 - To compare long term performance of various companies manufacturing and supplying dental implants.
- The collected data were compiled and analyzed using SPSS software (version 20.0). Categorical variables were expressed as frequency and percentage, and associations between variables were assessed using the Chi-square test. A p-value of less than 0.05 was considered statistically significant.

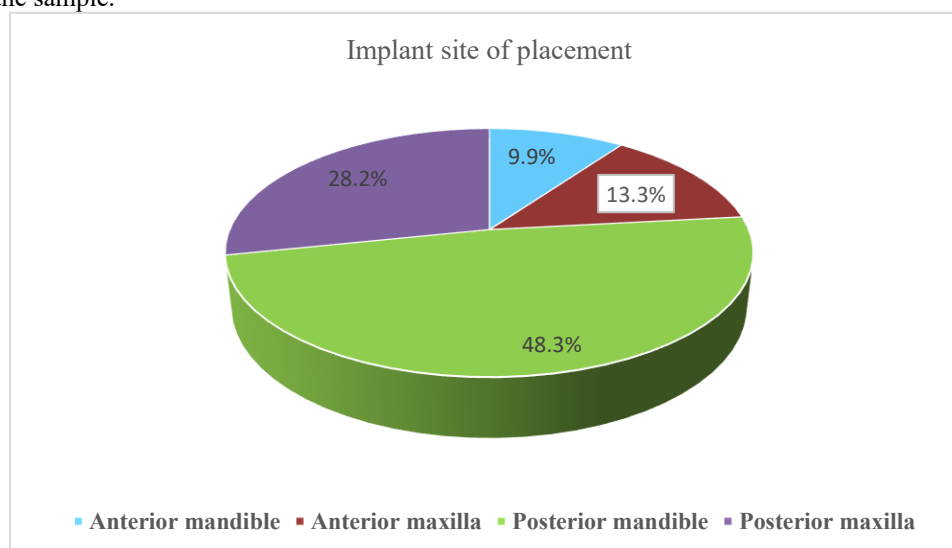
RESULTS

The distribution of the placement sites for both of the implants in the study population was presented in Table 1.

Implant site of placement	N	%
Anterior mandible	10	9.9
Anterior maxilla	15	13.3
Posterior mandible	58	48.3
Posterior maxilla	19	28.2
Total	102	100

Table 2: Distribution of implants according to placement sites

The dental implants were evaluated in terms of site distribution, in which the posterior regions accounted for the majority of the implants: the posterior mandible was the most common site (n=58,48.3%) followed by the posterior maxilla (n=19,28.2%) and anterior maxilla (n=15,13.3%), and anterior mandible (n=10,9.9%) accounted for a lesser proportion of the sample.

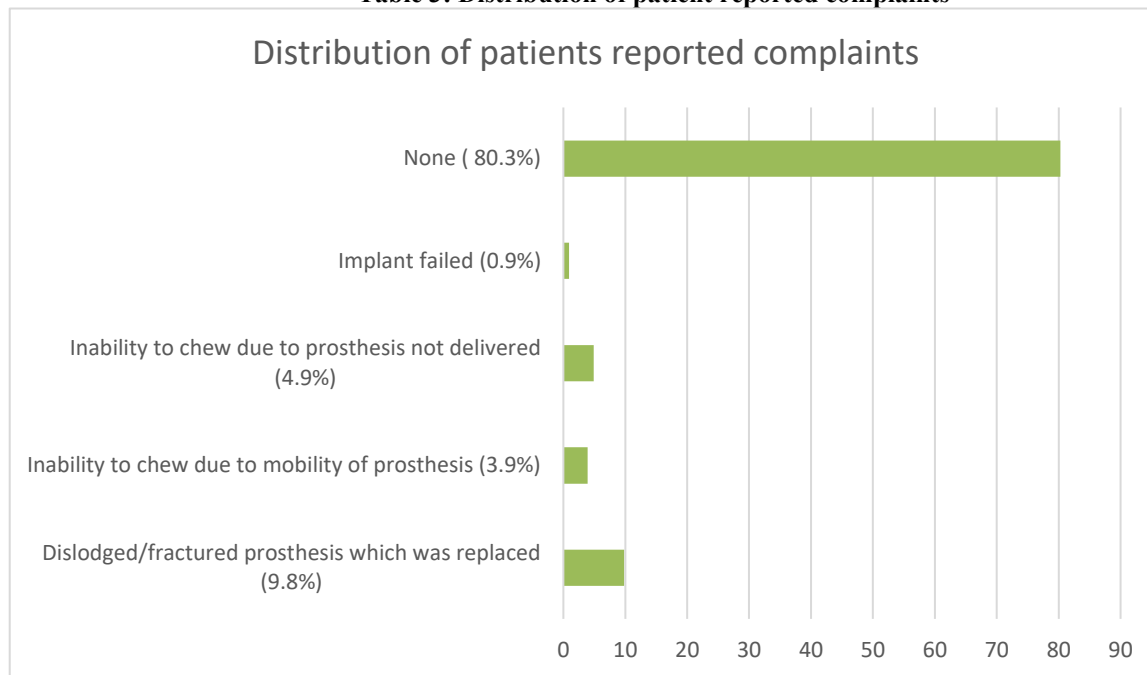


Graph 1: Showing the facts that have been stated above.

Within a total of 202 implants, the most frequent site was the posterior mandible (n=98,48.3%), followed by the posterior maxilla (n=57,28.2%), anterior maxilla (n=27,13.3%) and anterior mandible (n=20,9.9%). Patient-reported complaints are shown in Table 3, where the overwhelming majority of sites evaluated (n=82, 80.3%) reported no post-treatment complaints. The most common technical problem (10 cases, 9.8%) was dislodged or fractured prosthesis, including cases of chipping and replacement of the porcelain components of the prosthesis;

mobility during chewing caused chewing dysfunction was the second most common technical problem, with 5 cases (4.9%) and fourth most common technical problem was inability to chew due to undelivered prosthesis (4 cases, 3.9%). Absolute implant failure was least common (1 case, n=10,0.9%).

Table 3: Distribution of patient reported complaints



Graph 2 : Graphical Representation of Patient-Reported Complaints in percentage

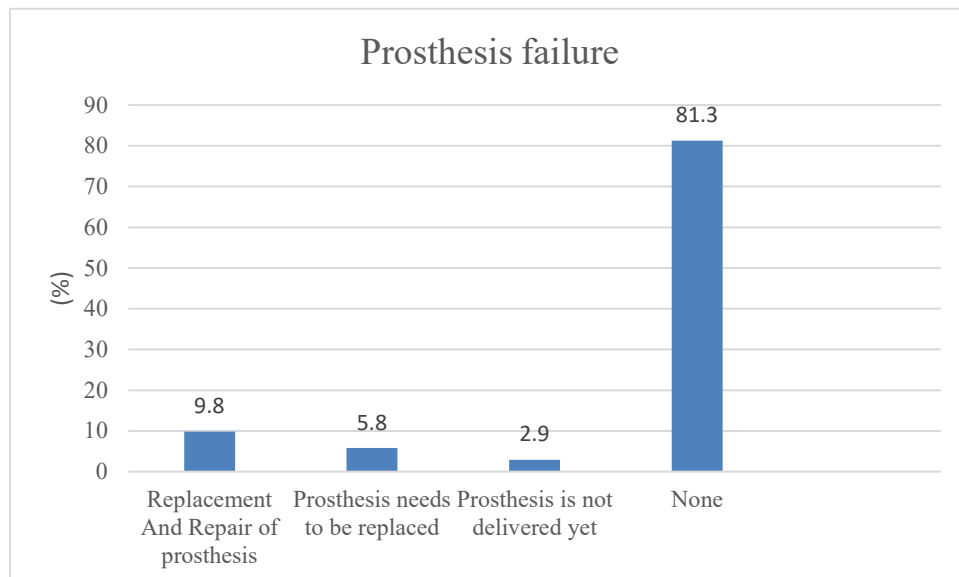
Graph 2: Showing the information outlined above.

Table 4 shows that the analysis of prosthetic intervention and failure rates based on the total number of patients evaluated showed that the majority of the patients did not require mechanical and/or prosthetic servicing or replacement (n=83, 81.3%). Fully replaced or structural maintenance (including repair and tightening of loose abutment connections) was reported in 9.8% of the cases (n=10) with prosthetic complications. In 5.8% of cases (n=6), the restoration was dislodged or became mobile and required active prosthetic replacement, and in 2.9% of patients (n=3) temporary functional limitations were experienced as a result of an undelivered restoration.

Table 4 : Distribution of prosthesis failure in patients

Prosthesis failure	N (No. of complaints for prosthesis)	%
Replacement of prosthesis (i.e, Dislodged / fractured prosthesis) and Repair or tightening of implant abutment (loosened implant abutment connection) has been done	10	9.8
Prosthesis needs to be replaced (i.e, Dislodged / mobility of prosthesis)	6	5.8
Prosthesis is not delivered yet (i.e, inability to chew)	3	2.9
None	83	81.3
Total	102	100

Complaints	N	%
None	82	80.3
Dislodged/fractured prosthesis or porcelain fracture, which was replaced	10	9.8
Mobility of the prosthesis while chewing- inability to chew	4	3.9
Inability to chew due to the prosthesis not delivered	5	4.9
Implant failed	1	0.9



Graph 3: Graphical Representation of Prosthesis Failure

Graph 3: Showing the information contained in the above.

Table 5 showed the evaluation of biological implant survival with an outstanding success rate for the entire cohort and all of the evaluated implants were in full function without failures. There was one instance of true failure of the biological implant ($n=1$, 0.9%).

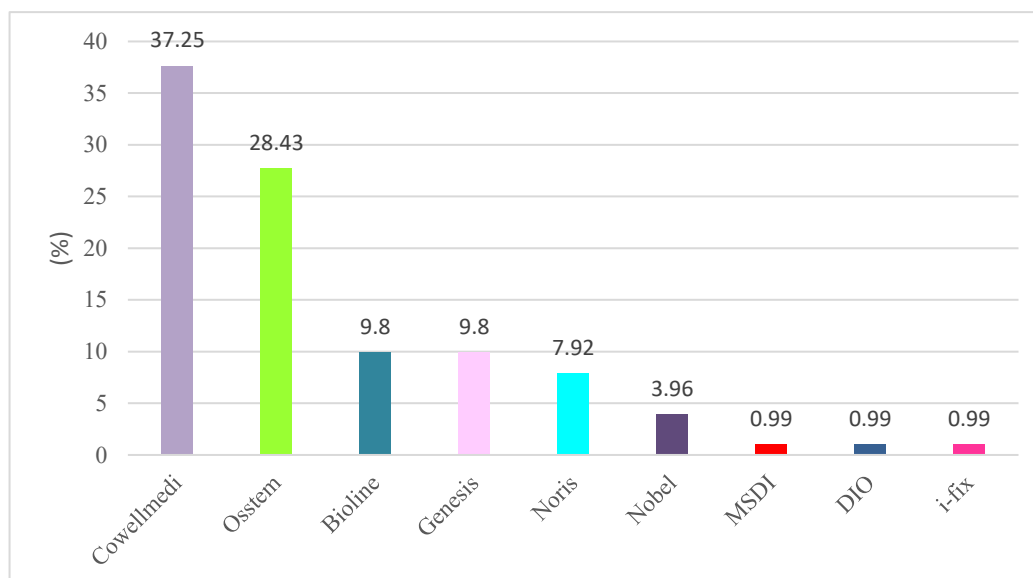
Table 5 : Distribution of implant failure in patients

Implant Failure	N	%
Implant failed	1	0.9
None	101	99.01
Total	102	100

Table 6 shows the overall distribution of the 9 implant systems assessed in this study by manufacturers. Cowellmedi was the most commonly used implant system, with 37.25% ($n = 38$) of all implants used, followed by Osstem with 28.43% ($n = 29$). Bioline and Genesis systems comprised 9.8% ($n = 10$) each of the sample, and Noris 8% ($n = 8$) of the sample. The remaining systems—Nobel (3.96%, $n = 4$), MSDI (0.99%, $n = 1$), DIO (0.99%, $n = 1$), and i-fix (0.99%, $n = 1$)—were used in smaller proportions across the patient cohort.

Table 6 : Distribution Of Implant Systems used in the study

Company of implants	N	%
Cowellmedi	38	37.25
Osstem	29	28.43
Bioline	10	9.8
Genesis	10	9.8
Noris	8	7.8
Nobel	4	3.9
MSDI	1	0.9
DIO	1	0.9
i-fix	1	0.9
Total	102	100



Graph 4: Graphical Representation of Implant Systems Used in the Study

Graph 4: To represent the details mentioned above.

Table 7 represents that in terms of absolute numbers, the highest number of prosthetic complaints was from single crowns (n = 10, 18.86% of total sample complaints) than the FPDs and full-arch prostheses (n = 3, 5.26% and n = 3, 5.26% respectively). If compared to the number of prostheses restored in each sub group, however, full-arch prostheses had a higher proportion of failures (27.2%) when compared with single crowns (18.86%).

Table 7 : Distribution of type of failed prosthesis in patients

Type of failed prosthesis	N (No. of complaints of failed prosthesis)	N (Total no. of each type of prosthesis)	%
Single crown	10	53	18.86
Full arch prosthesis	3	11	27.2
FPD	3	36	8.3
Total	16	102	100

Table 8 showed inferential cross tabulation of distribution of reported complaints across the number of implants placed per patient and it was seen that single implant restorations had the highest total number of mechanical complications (n=8) and were also the only (n=1) of the total number of reported cases of total implant failure. The largest asymptomatic cohorts were single and 2-implant groups, reporting no complaints (80 combined across all groups). Multi-implant restorations (three, four and six implants) had significantly fewer overall complaints, with three implant restorations reporting no complaints (n=10) and six implant restorations reporting one repair (n=1).

Table 8 : Association between number of implants and complaints

No. Of implants	Replacement of prosthesis (i.e, Dislodged / fractured prosthesis) and Repair or tightening of implant abutment (loosened implant abutment connection) has been done	Prosthesis needs to be replaced (Dislodged / mobility of prosthesis)	Prosthesis is not delivered yet (i.e, inability to chew)	Implant failed	None
One	5	3	1	1	37
Two	3	2	2		23
Three					10
Four	1	1			10
Six	1				0

DISCUSSION

While the basic biological parameters of dental implant success all rely on the objective parameters of achieving rigid osseointegration, stable functional loading, and absolute stability from the perspective of clinical mobility and radiolucency progression over time, there has been increasing emphasis placed on patient-reported outcomes.³ Although objective biological parameters are essential to evaluate the health of any dental implant, the concept of treatment success in contemporary implant dentistry would also include a greater emphasis on the patient's perception of the outcome.³

In the present retrospective questionnaire-based study, patients' overall satisfaction with the implant was high, and no subjective complaints were reported by 80.3% of the patients (Table 3). While objective clinical parameters are still crucial to assess treatment outcomes, they do not necessarily reflect the patient's perspective; the positive effects seen in this study have been replicated in long-term follow-up studies, which have consistently demonstrated that implant-supported prostheses have a positive impact on patients' oral health-related quality of life (OHRQoL). The favourable patient-reported results achieved in this study, therefore, suggest that Patient-Reported Outcome Measures (PROMs) can predict and deliver satisfactory implant rehabilitations in a postgraduate teaching environment.

Mechanical and technical complications have been reported in a number of patients, and have been present in a significant proportion of post-rehabilitation interventions,¹⁷ with several meta-analyses confirming that these are a common occurrence in implant dentistry. Loosening of the abutment screw, prosthesis loss, porcelain fracture and fracture of the restorative material were among the most common mechanical events reported in our study, with a total replacement of the prosthesis being the most common (9.8%). This is a repetition of the fact that strict prosthetic care and systematic recall systems are essential elements for the long-term success of prosthetics.¹⁷

The present study also revealed loosening of mechanical parts as a prevalent mechanical complication. Several factors have been attributed to the development of this complication, such as improper torque, excess functional loading, and design characteristics of the implants.¹⁸ Proper lab procedures, passive fit, and occlusal adjustment are key factors in reducing technical complications and the maintenance of a desirable force distribution in implant-supported restorations. The patient-reported outcomes (PROs) differed by the type of prosthesis. Patients receiving multi-unit restorations (especially FPDs and FADs) were less complaining and more stable than patients receiving single unit implant-supported crowns.⁹

Fixed partial dentures (18.75%) and full-arch prostheses (18.75%) were associated with the second most common prosthetic failure (Table 7). Single implant-supported crowns had the largest number of failed prostheses (62.5%). The same findings have been described in the literature: multi-unit restorations spread the functional loads more effectively and are more stable than single crowns. There are also patient-related factors that influence post-treatment satisfaction, such as expectations and attitude toward treatment.⁹ The outstanding results of dental implant rehabilitation, based on previous epidemiological studies, confirm the growing public trust and acceptance of this therapy.¹⁹

In order to make any scientific conclusions, researchers should use a consistent assessment and reporting system – if this is not done, clinical heterogeneity can significantly impact the ability to conduct comparative literature reviews. This study was conducted using a structured, retrospective and questionnaire format that was used to systematically and very reliably map patient experiences in parallel with the documented departmental data.⁸

In the current study, the most comprehensive range of implant systems was used, which included Cowellmedi (37.25%), Osstem (28.43%), Bioline (9.8%), Genesis (9.8%) and Noris (7.92%) with lesser numbers of fixtures placed for Nobel, MSDI, DIO and i-fix. This wide variation is representative of the diversity of clinical practice in institutional prosthetic rehabilitation in the real world. This data therefore cannot be used to draw valid conclusions about the superiority or inferiority of any particular implant system based on mechanical performance, as it is actually a complex combination of factors other than the brand that dictates long-term clinical performance of implants.^{17,18}

The conclusions reached in this institutional study are strongly supportive of the high success rate and highly predictable functionality and aesthetics of dental implant therapy carried out by postgraduates. Technical complications were highly correlated with the type of prosthesis, indicating the need for custom prosthetic planning, optimized occlusion protocols and regular recall maintenance to make implant restorations a long-term success.

Limitations of the Study

The present study has certain limitations. It was retrospective in nature and relied on patient recall, which may have introduced recall bias. Clinical examination of implants and prostheses was not performed, and the findings were based solely on patient-reported responses. In addition, some eligible patients could not be contacted, resulting in sample loss.

CONCLUSION

The conclusion from this institutional study is that the implant treatment provided by the post graduate residents in the study area gives predictable result, reliable functioning and satisfactory patient satisfaction to partially and completely edentulous patients within the limits of this study. During the follow-up period, the most common complications were mechanical or technical, not biological. Among different types of prostheses single crowns had highest number of failure compared to full arch prosthesis and fixed partial prosthesis. While bone integration has become commonplace, there are more factors that need to be accounted for when it comes to maintaining restorations over time, aside from the biological aspects. Mechanical complications can be minimized and long-term patient satisfaction can be maintained with careful planning, proper bite alignment, accurate screw torque and regular checks.

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