

# Single Tooth Implant versus Resin-Bonded Bridge: A Study of Patient's Satisfaction

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## Abstract

**Objective:** To compare the patients' satisfaction between patients treated with single tooth implant (STI) or resin bonded bridge (RBB) for single missing tooth replacement. **Methods:** A cross-sectional study was conducted in Faculty of Dentistry, Universiti Teknologi MARA (UiTM). Patients treated using STI ( $n=26$ ) and RBB ( $n=26$ ) were prospectively recruited. A validated patient satisfaction questionnaire was given to the participants to assess the aesthetics, masticatory function, phonetics, ease of cleaning and cost satisfaction using 7- point Likert scale. Demographic data (gender and age) and treatment data (site of treatment) were also collected. Differences in various aspects of satisfaction were compared. **Results:** STI and RBB groups has similar demographic and treatment characteristics. Both groups revealed high satisfaction with most of the aspects in the questionnaire. There was no statistically significant difference in overall satisfaction between the two treatment groups ( $p = 0.189$ ). However, STI group had a significant higher score in existing appearance ( $p = 0.010$ ), mastication ( $p = 0.018$ ) and phonetics ( $p = 0.029$ ) compared with RBB. Level of satisfaction did not differ by gender, age and site of the prostheses ( $p > 0.05$ ). Almost all of the participants would choose to undergo the same treatment again in UiTM (STI = 96.2%, RBB = 92.3%). **Conclusion:** Both STI and RBB participants were highly satisfied with the aesthetics, phonetics, cost and found that the treatment fees were justified and reasonable in UiTM. Therefore, both treatment options are good to be indicated for single missing tooth replacement.

**Keywords:** Patient's satisfaction, resin-bonded bridge, single tooth implant

## INTRODUCTION

Missing tooth incidence is mainly caused by caries and periodontal problem.<sup>[1,2]</sup> Tooth loss might lead to various consequences including compromised chewing function, pain, poor phonation, and dissatisfaction with the appearance. Subsequently, it worsens the general health and quality of life.<sup>[2,3]</sup> Therefore, there is an increase in demand of tooth replacement using various prosthodontic treatment options.<sup>[4]</sup>

Nowadays, many patients have reported improvement in their general satisfaction and quality of life, after receiving treatment for missing teeth replacement using fixed partial dentures.<sup>[5]</sup> The available treatment options include implant-supported restoration, conventional bridge, resin-bonded bridge (RBB), and fiber-reinforced composite resin bridge.<sup>[6,7]</sup> When comparing the above treatment options, there are a few patient and clinical factors that might need to be taken into consideration including treatment fees, longevity of the prostheses, esthetics, functions, risks, and complications of

the treatment.<sup>[8]</sup> In recent years, patient satisfaction is essential while assessing treatment success in dentistry. Patients' satisfaction is correlated directly with the oral care provided to patients.<sup>[9]</sup> Using questionnaire to evaluate the patients' satisfaction, most studies reported generally a high patients' satisfaction following implant therapy.<sup>[9-11]</sup> With regard to the missing tooth replacement using fixed prosthesis, there are some studies reported high patients' satisfaction after the treatments provided.<sup>[5,12]</sup>

A study done by Creugers *et al.* stated that overall satisfaction regarding RBBs was significantly correlated with "color"

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and “shape” of the prosthesis and inversely correlated with “complaints.” No statistical differences were found between male and female, and no significant changes were observed in patient satisfaction over time.<sup>[12]</sup> With regard to the implant therapy, a study done by Gurgel *et al.* reported that high degree of satisfaction was found for all parameters evaluated, regardless of gender, age, number of implants or type of prosthesis. “Comfort” was associated significantly with the number of implants, and “speaking” was associated significantly with the type of prosthesis.<sup>[10]</sup> Besides, many studies have revealed a high patients’ satisfaction in partially and completely edentulous patients treated with dental implants.<sup>[13]</sup>

Thus far, there is no study comparing patient satisfaction with single tooth replacement using RBB or single tooth implant (STI); the variance of patient’s satisfaction is somehow still unclear. Therefore, the aim of this study was to compare the patients’ satisfaction between STI and RBB for single missing tooth replacement.

### SUBJECTS AND METHODS

This study was a cross-sectional questionnaire study conducted among patients who received single missing tooth replacement using STI or RBB in the Faculty of Dentistry, Universiti Teknologi MARA (UiTM). Ethics approval was obtained from the Ethics Committee of the Institute of Research Management and Innovation, UiTM (Reference: REC/110/18).

With regard to the sample size determination, calculation using G Power 3.0 software (Free Software, Department of Psychology, Heinrich-Heine-Universität Düsseldorf, Germany) was performed, with  $\alpha = 0.05$ , effect size  $d$ , and power = 0.8. Thus, the sample size for each group (RBB and STI) is 26.

To recruit the participants in this survey, the following inclusion criteria were used:

1. Single tooth missing, replaced using either STI or RBB for a minimum of 3-month follow-up
2. Minimum 20 teeth

3. Have an adequate cognitive ability in understanding and answering the questions (English or Malay)
4. Healthy periodontal status.

Fifty-two subjects that met the inclusion criteria were invited to participate in the present study as a single convenience sample. They were recruited from the patients’ list treated by the undergraduate and postgraduate clinicians and specialists in the Faculty of Dentistry, UiTM. Informed consents were obtained from all the recruited subjects. They were called for a short clinical review and asked to fill in the questionnaires.

A previously validated patients’ satisfaction questionnaire from Layton and Walton, 2011 was adopted for an evaluation after the prosthodontic treatment of missing tooth replacement.<sup>[14]</sup> Seven questions (Q1–Q7) will be scaled using 7-point Likert scale regarding esthetics, masticatory function, phonetics, ease of cleaning, and cost satisfaction. The last question (Q8) was single yes or no question assessing the willingness of subject to undergo the same treatment again in UiTM [Figure 1]. A back-to-back translation of the questionnaire from English to Malay was completed by the researchers and validated by two prosthodontists. Overall satisfaction was obtained by a mean after summing up the score of Q1–Q7. Range of score of 1–2, 3–4, and 5–7 were considered as low, medium, and high satisfaction, respectively.

The data were analyzed using Statistical Software (SPSS Statistics 25, IBM, Chicago, IL, USA). Comparison of overall satisfaction and Q1–Q7 between STI and RBB group was analyzed using independent *t*-test. One-way ANOVA test and independent *t*-test were used to analyze the association patient satisfaction with age and other factors (gender and site of the prosthesis), respectively. Significance was predetermined at  $P = 0.05$ .

### RESULTS

Table 1 presents the demographic and treatment data of the patients. A total of 52 patients were recruited in this study (50% RBB and 50% STI). The demographic characteristics

**Table 1: Characteristics of the recruited subjects for single missing tooth replacement**

	RBB			STI			Significance (P)
	n (%)	Mean±SD	P	n (%)	Mean±SD	P	
Gender							
Male	13 (50)	5.68±0.87	0.283	11 (42)	5.79±0.80	0.980	0.265
Female	13 (50)	5.22±1.24		15 (58)	5.80±0.78		
Age							
<29	5 (19)	6.00±1.21	0.169	2 (7)	5.57±1.01	0.159	0.193
30-44	12 (47)	5.52±0.77		7 (27)	6.04±0.56		
45-59	4 (15)	4.43±1.35		12 (47)	5.48±0.90		
>60	5 (19)	5.54±1.16		5 (19)	6.31±0.21		
Site							
Anterior	3 (12)	5.38±0.70	0.908	1 (4)	5.43±0.00	0.638	0.616
Posterior	23 (88)	5.46±1.13		25 (96)	5.81±0.79		

SD: Standard deviation, STI: Single tooth implant, RBB: Resin-bonded bridge

**PATIENTS SATISFACTION QUESTIONNAIRE**

Please answer the following questions by placing a cross on the line at the point at which you feel represents the answer. Note the start of the line on the left side represents the worst possible result or experience that you could imagine whereas the end of the line of the right side represents the absolute best possible result or experience you could imagine. Place a tick in the appropriate box for the last two questions.

- How would you rate the appearance of your teeth immediately after the treatment?  
 Extremely poor ——— | ——— | ——— | ——— | ——— | ——— | ——— Excellent  
 1 2 3 4 5 6 7
- How would you rate the appearance of those teeth today?  
 Extremely poor ——— | ——— | ——— | ——— | ——— | ——— | ——— Excellent  
 1 2 3 4 5 6 7
- How would you rate your present capacity to chew?  
 Extremely poor ——— | ——— | ——— | ——— | ——— | ——— | ——— Excellent  
 1 2 3 4 5 6 7
- How would you rate your present capacity to speak?  
 Extremely poor ——— | ——— | ——— | ——— | ——— | ——— | ——— Excellent  
 1 2 3 4 5 6 7
- How easy do you find it to clean your teeth and gums?  
 Extremely difficult ——— | ——— | ——— | ——— | ——— | ——— | ——— Extremely easy  
 1 2 3 4 5 6 7
- What did you think about the financial cost of your treatment at the time of treatment here?  
 Extremely costly ——— | ——— | ——— | ——— | ——— | ——— | ——— Extremely reasonable  
 1 2 3 4 5 6 7
- In hindsight, how would you rate the initial financial cost of your dental treatment here?  
 Extremely unjustified ——— | ——— | ——— | ——— | ——— | ——— | ——— Extremely justified  
 1 2 3 4 5 6 7
- In hindsight would you undergo the treatment you had for your mouth and teeth again here?  
 YES  NO

**Figure 1:** Patient satisfaction questionnaire

of two groups were similar. Almost half of the patients were female for both groups (RBB = 50%; STI = 58%); majority of them are middle age group, ranged from 30 to 59 years. Regarding the site of prostheses, most of them are posterior (RBB = 88%; STI = 96%).

The mean for overall patients' satisfaction of STI and RBB was 5.8 and 5.5, respectively [Table 2]. There was no statistically significant difference between these two treatment groups ( $P = 0.189$ ). Level of satisfaction did not differ by gender, age, and site of the prostheses ( $P = 0.265$ ,  $P = 0.193$ , and  $P = 0.616$ , respectively). As shown in Table 2, both treatment groups showed high satisfaction (mean >5.0) in

esthetics (Q1 and Q2), phonetic (Q4), and cost of the treatment (Q6 and Q7). The STI reported higher satisfaction (mean = 5.9) in masticatory function (Q3) compared to RBB (mean = 4.9). In addition, both groups indicated medium satisfaction for ease of cleaning (Q5). In comparison, STI group had a significant higher score for existing appearance ( $P = 0.010$ ), mastication ( $P = 0.018$ ), and phonetics ( $P = 0.029$ ) parameters compared to the RBB group.

Both males and females expressed high level of satisfaction with RBB in response to esthetic, phonetic, and cost of treatment (Q1, Q2, Q4, Q6, and Q7) with a mean value ranging from 5.00 to 6.50 [Figure 2]. Both genders also scored

medium satisfaction for ease of cleaning (Q5) parameter (mean <5.00). Statistically, male scored significantly higher for initial appearance (Q1) ( $P = 0.048$ ) and cost satisfaction (Q6) ( $P = 0.045$ ) compared to female. There was no significant association between overall patients' satisfaction of RBB with gender ( $P = 0.283$ ). More than 70% of the participants reported high level of satisfaction for both anterior and posterior RBB in response to esthetic, phonetic, and cost of treatment (Q1, Q2, Q4, Q6, and Q7) [Figure 2]. However, there were no statistically significant differences in overall satisfaction ( $P = 0.908$ ) and all parameters ( $P > 0.05$ ) between the anterior and posterior RBB.

**Table 2: Comparison between single tooth implant and resin-bonded bridge for each question**

Questions	Mean±SD		Significance (P)
	STI (n=26)	RBB (n=26)	
Q1	6.00±1.02	5.50±1.03	0.085
Q2	6.12±0.91	5.27±1.34	0.010*
Q3	5.92±1.09	4.88±1.86	0.018*
Q4	6.58±0.58	6.04±1.08	0.029*
Q5	4.92±1.79	4.73±1.46	0.673
Q6	5.00±1.70	5.69±1.72	0.150
Q7	6.19±0.94	6.04±1.40	0.644
Total	5.82±0.78	5.45±1.07	0.189

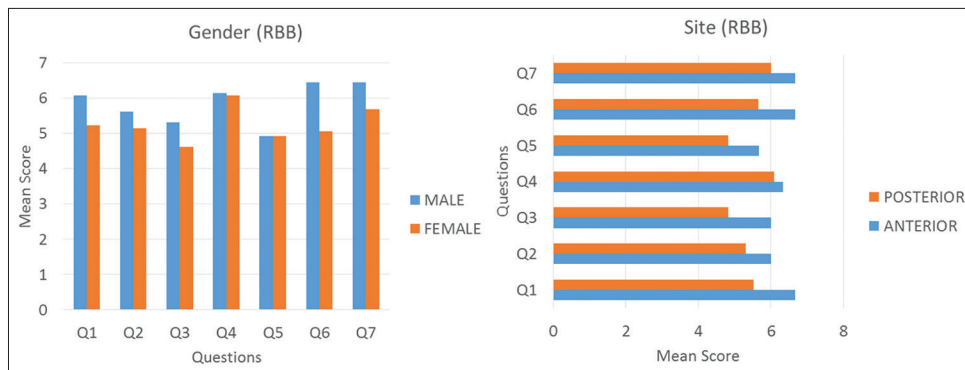
\*Statistically significance ( $P < 0.05$ ). SD: Standard deviation, STI: Single tooth implant, RBB: Resin-bonded bridge

Patients' satisfaction in relation to gender for STI group showed no significant difference in all parameters and overall satisfaction ( $P > 0.05$ ). Both genders reported high satisfaction to initial and existing appearance (Q1 and Q2), masticatory function (Q3), and phonetics (Q4) parameters. However, the female group showed a medium satisfaction pertaining to ease of cleaning and cost satisfaction (Q5 and Q6) [Figure 3]. As shown in Figure 3, both anterior and posterior STI reported high satisfaction in esthetic, masticatory function, phonetics, and initial cost of treatment (Q1–Q4, and Q7). There was no significant difference in all aspects of the questionnaire and overall satisfaction ( $P > 0.05$ ).

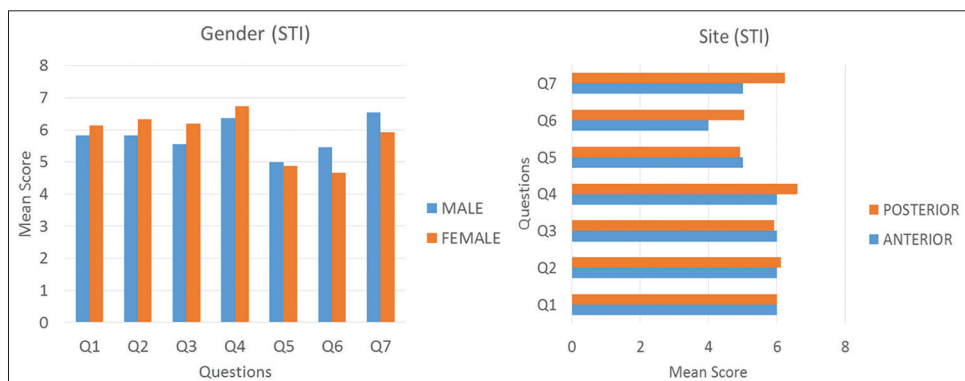
With regard to question Q8, 92.3% of the RBB and 96.2% of the STI patients chose to undergo the same treatment again in the Faculty of Dentistry, UiTM [Figure 4].

### DISCUSSION

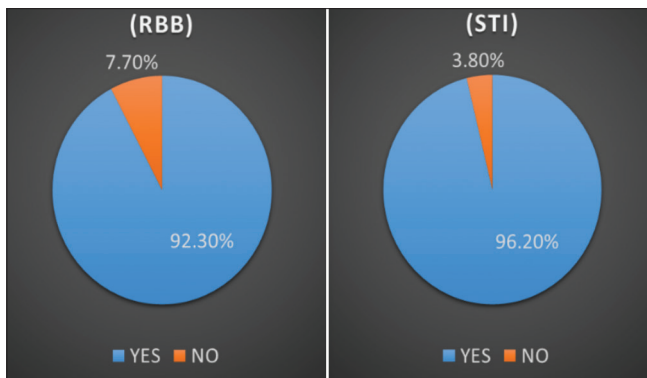
This study assessed the patient's satisfaction after receiving single missing tooth replacement using STI and RBB. The mean of overall satisfaction of STI was slightly higher than the RBB group. However, the difference was not statistically significant ( $P = 0.189$ ). This result is in agreement with Lam *et al.* They found no significant differences on oral health-related quality of life between the implant-supported crown and two-unit cantilevered RBB in a bounded single tooth space.<sup>[15]</sup>



**Figure 2:** Mean score of each question for resin-bonded bridge group in relation to gender and site



**Figure 3:** Mean score of each question for single tooth implant group in relation to gender and site



**Figure 4:** Percentage of the participants that would like to undergo treatment in Universiti Teknologi MARA again

Both treatment modes reported a high satisfaction in esthetics. However, STI group has reported a higher satisfaction on the existing appearance. High satisfaction with implant is not unusual; many studies have reported similar finding.<sup>[16-22]</sup> Moreover, STI group noted a high satisfaction in masticatory function compared to RBB. This result is consistent with a previous study carried out by Hebel *et al.* They reported that implants gave a significant advantages in terms of esthetics and functions.<sup>[23]</sup> With regard to the ease of cleaning aspect, both groups in this study reported medium satisfaction. Most of the prostheses for both groups were located at the posterior region. The patients may have difficulty in flossing for a bridge in RBB group. While the tight contacts in between the new implant crown and teeth for STI group may also contribute to the difficulty in cleaning.<sup>[24]</sup> Besides, both groups also reported a high satisfaction regarding initial cost of treatment. This finding may be due to low charges of government teaching institute. Even though the cost of implant was higher than RBB, patients still found it reasonable and justified, especially when they compared the treatment fees with private practices, which may be double or triple higher than in UiTM. For the last question (Q8), most of the patients would like to undergo the same treatment again in UiTM. Two patients in RBB group refused due to longer treatment time taken by the undergraduate clinicians. An STI patient decided not to return due to time constraint, as implant treatment required multiple visits of at least 4–6 months of treatment duration.

Level of satisfaction did not differ by gender, age, and site of the prosthesis in the present study. This finding was also consistent with one previous study by Gurgel *et al.*; they stated that high degrees of satisfaction (greater than 91%) for all categories evaluated, regardless of gender, age, number of implant, or type of prosthesis.<sup>[10]</sup> Another study regarding patient satisfaction of RBB revealed no statistical significant difference between males and females.<sup>[12]</sup>

The limitation of this study is the small sample size for the anterior prostheses. Therefore, these results should be interpreted with caution. Besides that, the present study was a cross-sectional design; all the patients who had been treated

using STI and RBB might have some recall bias to answer some of the questions.

## CONCLUSIONS

Both STI and RBB patients were highly satisfied with esthetics, phonetics, and cost. They found that the treatment fees were justified and reasonable in UiTM. Therefore, both treatment options are good to be indicated for patients with single missing tooth. However, there is also uncertainty exists due to small sample size and recall bias. Therefore, prospective studies with larger samples are required to confirm the present results.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

- Ha JE, Heo YJ, Jin BH, Paik DI, Bae KH. The impact of the National Denture Service on oral health-related quality of life among poor elders. *J Oral Rehabil* 2012;39:600-7.
- Nickenig HJ, Wichmann M, Andreas SK, Eitner S. Oral health-related quality of life in partially edentulous patients: Assessments before and after implant therapy. *J Craniomaxillofac Surg* 2008;36:477-80.
- Walton JN, MacEntee MI. Choosing or refusing oral implants: A prospective study of edentulous volunteers for a clinical trial. *Int J Prosthodont* 2005;18:483-8.
- Bilhan H, Erdogan O, Ergin S, Celik M, Ates G, Geckili O. Complication rates and patient satisfaction with removable dentures. *J Adv Prosthodont* 2012;4:109-15.
- Jepson N, Allen F, Moynihan P, Kelly P, Thomason M. Patient satisfaction following restoration of shortened mandibular dental arches in a randomized controlled trial. *Int J Prosthodont* 2003;16:409-14.
- Richardson G, Russell KA. Congenitally missing maxillary lateral incisors and orthodontic treatment considerations for the single-tooth implant. *J Can Dent Assoc* 2001;67:25-8.
- Al-Quran FA, Al-Ghalayini RF, Al-Zu'bi BN. Single-tooth replacement: Factors affecting different prosthetic treatment modalities. *BMC Oral Health* 2011;11:34.
- Fillion M, Aubazac D, Bessadet M, Allègre M, Nicolas E. The impact of implant treatment on oral health related quality of life in a private dental practice: A prospective cohort study. *Health Qual Life Outcomes* 2013;11:197.
- Adler L, Liedholm E, Silvegren M, Modin C, Buhlin K, Jansson L. Patient satisfaction 8-14 years after dental implant therapy – A questionnaire study. *Acta Odontol Scand* 2016;74:423-9.
- Gurgel BC, Pascoal AL, Souza BL, Dantas PM, Montenegro SC, Oliveira AG, *et al.* Patient satisfaction concerning implant-supported prostheses: An observational study. *Braz Oral Res* 2015;29:1-6.
- Eltayeb AS, Satti AA, Osman MS, Ahmad AG. Patient's satisfaction following dental implant treatment among Sudanese patients. *IOSR J Dent Med Sci* 2016;15:75-9.
- Creugers NH, Käyser AF, Van't Hof MA. A seven-and-a-half-year survival study of resin-bonded bridges. *J Dent Res* 1992;71:1822-5.
- Bae KH, Kim C, Paik DI, Kim JB. A comparison of oral health related quality of life between complete and partial removable denture-wearing older adults in Korea. *J Oral Rehabil* 2006;33:317-22.
- Layton D, Walton T. Patient-evaluated dentistry: Development and

- validation of a patient satisfaction questionnaire for fixed prosthodontic treatment. *Int J Prosthodont* 2011;24:332-41.
15. Lam WY, McGrath CP, Botelho MG. Impact of complications of single tooth restorations on oral health-related quality of life. *Clin Oral Implants Res* 2014;25:67-73.
  16. Vermynen K, Collaert B, Lindén U, Björn AL, De Bruyn H. Patient satisfaction and quality of single-tooth restorations. *Clin Oral Implants Res* 2003;14:119-24.
  17. Gotfredsen K. A 10-year prospective study of single tooth implants placed in the anterior maxilla. *Clin Implant Dent Relat Res* 2012;14:80-7.
  18. Andersson B, Bergenblock S, Fürst B, Jemt T. Long-term function of single-implant restorations: A 17- to 19-year follow-up study on implant infraposition related to the shape of the face and patients' satisfaction. *Clin Implant Dent Relat Res* 2013;15:471-80.
  19. Santing HJ, Raghoebar GM, Vissink A, den Hartog L, Meijer HJ. Performance of the Straumann bone level implant system for anterior single-tooth replacements in augmented and nonaugmented sites: A prospective cohort study with 60 consecutive patients. *Clin Oral Implants Res* 2013;24:941-8.
  20. Moghadam M, Dias R, Kuyinu E, Ferguson MB, Mucciolo T, Jahangiri L. Predoctoral fixed implant patient satisfaction outcome and challenges of a clinical implant competency. *J Dent Educ* 2012;76:437-42.
  21. Schropp L, Isidor F. Clinical outcome and patient satisfaction following full-flap elevation for early and delayed placement of single-tooth implants: A 5-year randomized study. *Int J Oral Maxillofac Implants* 2008;23:733-43.
  22. Walton TR, Layton DM. Satisfaction and patient-related outcomes in 128 patients with single implant crowns *in situ* for up to 14 years. *Int J Oral Maxillofac Implants* 2017;32:667-74.
  23. Hebel K, Gajjar R, Hofstede T. Single-tooth replacement: Bridge vs. implant-supported restoration. *J Can Dent Assoc* 2000;66:435-8.
  24. Gatten DL, Riedy CA, Hong SK, Johnson JD, Cohenca N. Quality of life of endodontically treated versus implant treated patients: A university-based qualitative research study. *J Endod* 2011;37:903-9.

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