

Satisfaction Index of Single Versus Two Implant-Supported Mandibular Overdenture- A Questionnaire Survey

Dr. Raveena Makker¹, Dr. Rajeev Srivastava², Dr. Puneet Gupta³, Dr. Rohit Sharma⁴, Dr. Shailee Jain⁵

¹MDS, Ph.D Scholar, Department of Prosthodontics, Crown & Bridge, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India.

²MDS, PhD, Professor and Head, Department of Prosthodontics, Crown & Bridge, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India.

³MDS, Associate Professor, Department of Public Health Dentistry, Government College of Dentistry, Indore, Madhya Pradesh, India.

⁴MDS, Professor, Department of Prosthodontics, Crown & Bridge, Pacific Dental College and Research Centre, Udaipur, Rajasthan, India.

⁵MDS, Assistant Professor, Department of Prosthodontics, Crown & Bridge, Pacific Dental College and Research Centre, Udaipur, Rajasthan, India.

*Corresponding Author:

Dr. Raveena Makker

Ph.D Scholar, Department of Prosthodontics, Crown & Bridge, Index Institute of Dental Sciences, Malwanchal University, Indore, Madhya Pradesh, India

[Cite this paper as:](#) Dr. Raveena Makker, Dr. Rajeev Srivastava, Dr. Puneet Gupta, Dr. Rohit Sharma, Dr. Shailee Jain, (2025) Satisfaction Index of Single Versus Two Implant-Supported Mandibular Overdenture- A Questionnaire Survey. *Journal of Neonatal Surgery*, 14 (27s), 799-805.

ABSTRACT

Background: Edentulism is a physical disability that adversely influences a person's overall well-being, affecting essential functions like chewing, speech and facial aesthetics, leading to reduced self-confidence. Implant-supported overdentures are now a widely used rehabilitation option owing to the increasing awareness of dental implant treatments. This study aimed to evaluate and compare the satisfaction levels of patients with single versus two implant-supported mandibular overdentures in terms of retention, maintenance of hygiene, esthetics, speech, comfort, stability, mastication and overall quality of life.

Material and Methods: This study was conducted in the Department of Prosthodontics and Crown & Bridge at Index Institute of Dental Sciences, Indore. Written informed consent was obtained. The study subjects were patients rehabilitated with single as well as two implant-supported mandibular overdentures (MOs) (n=30 in each group). A questionnaire was designed and validated by experts in both English and Hindi and patients were made to fill out the questionnaire. Chi-square test was used to compare responses between the groups.

Results: Both groups demonstrated similar patient satisfaction levels except satisfaction in retention and denture stability which was higher in two implant-supported MO ($p < 0.05$). Moreover, patient satisfaction in retention was higher with bar-supported two implant MO and in regards to ease of cleaning, satisfaction was rated higher with single implant-supported MO.

Conclusion: Both treatment approaches showed satisfactory patient outcomes, suggesting that a single-implant overdenture could serve as a practical and affordable option for individuals with financial limitations or anatomical restrictions.

Keywords: Patient satisfaction, single implant-supported mandibular overdenture, two implant-supported mandibular overdenture, questionnaire, Oral Health Quality of Life

1. INTRODUCTION

Loss of teeth, especially in the mandibular arch, can have a major effect on a patient's ability to speak, chew, and smile, all of which can have an influence on their general health and quality of life (1). The absence of teeth in the mandible is especially challenging because of the reduced stability of conventional dentures which can lead to discomfort, poor retention, and an

increased need for denture adhesives, making daily activities such as eating and speaking more difficult. In this context, implant-supported overdentures (ISOs) have become a widely accepted and increasingly popular solution for edentulous patients.

Implant-supported overdentures provide the stability and retention that traditional dentures lack, resulting in a more comfortable, functional, and aesthetically pleasing prosthesis. Overdentures can be supported by one or more implants, with the two-implant overdenture being the current gold standard in mandibular prosthetics (2) due to its proven effectiveness in providing adequate retention, stability, and improving patient satisfaction (3).

While two-implant overdentures are the established treatment modality, recent studies have explored the potential of single-implant-supported overdentures (4). This option offers a more cost-effective and less invasive alternative to the two-implant approach. A single implant in the mandibular arch can still provide sufficient stability for an overdenture, especially for patients who have limited bone volume or are at high risk for surgical complications. The main advantages of single-implant overdentures include lower costs (since fewer implants are required), reduced surgical time, and less postoperative discomfort (5).

Previous research has consistently shown that mandibular overdentures with two implants offer superior clinical outcomes compared to those with a single implant (6,7). Despite this, there has been relatively little investigation into how patients perceive and experience these different treatment options. Most studies have concentrated on objective clinical measures, leaving a gap in understanding the subjective perspectives of patients. As a result, there is a need for more research that explores patients' personal experiences and satisfaction levels with these prosthetic solutions. This survey concentrated on gathering patient's perspectives on the essential features of mandibular overdentures. Incorporating patient-reported outcomes allows healthcare providers to understand the effectiveness of treatments from the patient's viewpoint. These outcomes help to highlight areas where patients experience benefits or challenges, offering valuable feedback for tailoring treatment plans. Additionally, they serve as a guide for clinicians in choosing the most appropriate interventions for different patient populations, ensuring that care is both personalized and effective. By focusing on patient-based outcomes, healthcare can become more patient-centred, improving overall satisfaction and treatment success.

This survey aimed to compare the satisfaction levels of patients using single-implant versus two implant-supported mandibular overdentures (MOs). By understanding patient experiences, preferences, and functional outcomes associated with these two treatment options, the survey can provide valuable insights into the effectiveness and practicality of single-implant overdentures as an alternative to the two-implant approach. It focused on key aspects such as i) retention ii) comfort and ease of use iii) aesthetic outcomes iv) hygiene maintenance v) stability vi) speech vii) mastication and viii) overall general satisfaction. The null hypothesis assumed was that there would be no significant difference in the various aspects mentioned above between single and two implant-supported mandibular overdentures.

2. MATERIALS AND METHODS

The study employed a descriptive, cross-sectional design. This study was conducted in the Department of Prosthodontics and Crown & Bridge at Index Institute of Dental Sciences, Indore. The study subjects were patients rehabilitated with single as well as two implant-supported mandibular overdentures since 2022. A total of 60 patients (n=30 in each group), 50 males and 10 females with an age range of 40 to 80 years were included in the study. Written informed consent was obtained. A questionnaire was designed and validated by experts in both English and Hindi and patients were made to fill out the questionnaire. The questionnaire was divided into sociodemographic details and satisfaction-related questions (Table 1). The questionnaire evaluated satisfaction of patients regarding retention, ease of cleaning, overall appearance, visibility and plane of mandibular teeth, ability to speak, comfort, denture stability and chewing efficiency.

Data was entered in Microsoft Excel and further analysis was performed in SPSS version 25.0. Cross tabulation was done to check the response to questions by categories. Since the data collected was qualitative, Chi square test was used to compare difference in responses between the groups. Alpha was set to 5% and a p value less than 0.05 was considered statistically significant.

3. RESULTS

Table 1 shows that in both the groups, majority of participants were males (80% in Group 1 and 86.75% in Group 2) between 51 to 70 years with a basic education (56.7% and 66.7% respectively). Majority of them cleaned their teeth twice a day (53.3% and 56.7% respectively), having conventional complete denture as the antagonist (83.3%).

The retention system used in single implant-supported MO was ball attachment (100.0%), while in two implant-supported MO, ball attachment was used in majority of the patients (56.7%) and bar attachment in 43.3% of the patients. Regarding patient satisfaction, in both the groups, most of the patients were satisfied with their retention (83.3% and 53.3% respectively), overall general satisfaction (83.3% and 90.0% respectively), ease of cleaning (76.7% and 63.3% respectively), overall appearance (76.7% and 83.3% respectively), visibility of mandibular teeth (56.7% and 50% respectively), plane of mandibular teeth (53.3% and 56.7% respectively), ability to speak (66.7% and 83.3% respectively), comfort (83.3% and

86.7% respectively), denture stability (73.3% and 100% respectively) and had 60-80% improvement in chewing of food in both the groups. However, only patient satisfaction in retention and denture stability was found to be statistically significant ($p < 0.05$). All other results were statistically insignificant ($p > 0.05$).

Table 1: Responses between Single Implant and Two Implant-supported Mandibular Overdentures

Study Variables		Single Implant	Two Implant	Chi Square Test
Gender	Male	24 (80%)	26 (86.7%)	$p = 0.488$
	Female	6 (20%)	4 (13.3%)	
Age	40-50 years	2 (6.7%)	3 (10.0%)	$p = 0.939$
	51-60 years	13 (43.3%)	14 (46.7%)	
	61-70 years	13 (43.3%)	11 (36.7%)	
	71-80 years	2 (6.7%)	2 (6.7%)	
Level of education	Illiterate	7 (23.3%)	3 (10%)	$p = 0.399$
	Basic education	17 (56.7%)	20 (66.7%)	
	Secondary education	5 (16.7%)	4 (13.3%)	
	Undergraduate	1 (3.3%)	3 (10.0%)	
Frequency of cleaning daily	Once a day	7 (23.3%)	6 (20.0%)	$p = 0.948$
	Twice a day	16 (53.3%)	17 (56.7%)	
	After each meal	7 (23.3%)	7 (23.3%)	
Type of Antagonist	Complete denture	25 (83.3%)	25 (83.3%)	$p = 1$
	Removable partial denture	3 (10.0%)	3 (10.0%)	
	Tooth-supported FPD	2 (6.7%)	2 (6.7%)	
Retention System of the Overdenture	Ball	30 (100%)	17 (56.7%)	$p < 0.001$
	Bar	0 (0.0%)	13 (43.3%)	
Retention	Very satisfied	4 (13.3%)	14 (46.7%)	$p = 0.014$
	Satisfied	25 (83.3%)	16 (53.3%)	
	Dissatisfied	1 (3.3%)	0 (0.0%)	
Overall general satisfaction	Satisfied	25 (83.3%)	27 (90.0%)	$p = 0.543$
	Neutral	4 (13.3%)	3 (10.0%)	
	Dissatisfied	1 (3.3%)	0 (0.0%)	
Ease of cleaning	Satisfied	23 (76.7%)	19 (63.3%)	$p = 0.268$
	Neutral	7 (23.3%)	9 (30%)	
	Dissatisfied	0 (0.0%)	2 (6.7%)	
Overall appearance	Satisfied	23 (76.7%)	25 (83.3%)	$p = 0.556$
	Neutral	6 (20.0%)	5 (16.7%)	
	Dissatisfied	1 (3.3%)	0 (0.0%)	

Visibility of mandibular teeth	Satisfied	17 (56.7%)	15 (50%)	p= 0.673
	Neutral	11 (36.7%)	11 (36.7%)	
	Dissatisfied	2 (6.7%)	4 (13.3%)	
Plane of mandibular teeth	Satisfied	16 (53.3%)	17 (56.7%)	p= 0.097
	Neutral	14 (46.7%)	10 (33.3%)	
	Dissatisfied	0 (0.0%)	3 (10.0%)	
Ability to speak	Satisfied	20(66.7%)	25(83.3%)	p= 0.259
	Neutral	9(30.0%)	5(16.7%)	
	Dissatisfied	1(3.3%)	0(0.0%)	
Comfort	Satisfied	25 (83.3%)	26 (86.7%)	p= 0.601
	Neutral	4 (13.3%)	4 (13.3%)	
	Dissatisfied	1 (3.3%)	0 (0.0%)	
Denture Stability	Satisfied	22 (73.3%)	30 (100.0%)	p= 0.01
	Neutral	7 (23.3%)	0 (0.0%)	
	Dissatisfied	1 (3.3%)	0 (0.0%)	
Improvement in chewing of food	20-40%	1 (3.3%)	0 (0.0%)	p= 0.636
	40-60%	5 (16.7%)	3 (10.0%)	
	60-80%	13 (43.3%)	14 (46.7%)	
	80-100%	11 (36.7%)	13 (43.3%)	

Table 2 shows further association between the retention system used in the overdenture (ball versus bar) and the satisfaction in retention, ease of cleaning, visibility and plane of mandibular teeth, denture stability and improvement in chewing of food. Regarding patient satisfaction in retention, all the patients with bar attachment reported maximum satisfaction (100%), whereas 87.2% of patients were satisfied with ball attachment, which was found to be statistically significant ($p<0.001$). With respect to ease of cleaning, the results show that patient satisfaction was lower in bar attachment (46.2%) as compared to ball attachment (76.6%), which was also found to be statistically significant ($p=0.009$). All other associations were found to be statistically insignificant ($p>0.05$).

Table 2: Responses between Ball and Bar type of retention

Question		Retention System of the Overdenture		Chi Square Test
		Ball	Bar	
Retention Satisfaction	Very satisfied	5 (10.6%)	13 (100%)	p<0.001
	Satisfied	41 (87.2%)	0 (0.0%)	
	Dissatisfied	1 (2.1%)	0 (0.0%)	
Ease of cleaning	Satisfied	36 (76.6%)	6 (46.2%)	p= 0.009
	Neutral	11 (23.4%)	5 (38.5%)	
	Dissatisfied	0 (0.0%)	2 (15.4%)	
Visibility of Mandibular teeth	Satisfied	28 (59.6%)	4 (30.8%)	p= 0.089

	Neutral	16 (34.0%)	6 (46.2%)	
	Dissatisfied	3 (6.4%)	3 (23.1%)	
Plane of Mandibular teeth	Satisfied	25 (53.2%)	6 (46.2%)	p= 0.152
	Neutral	21 (44.7%)	5 (38.5%)	
	Dissatisfied	1 (2.1%)	2 (15.4%)	
Denture Stability	Satisfied	39 (83.0%)	13 (100%)	p= 0.279
	Neutral	7 (14.9%)	0 (0.0%)	
	Dissatisfied	1 (2.1%)	0 (0.0%)	
Improvement in Chewing	20-40%	1 (2.1%)	0 (0.0%)	p= 0.342
	40-60%	7 (14.9%)	1 (7.7%)	
	60-80%	23 (48.9%)	4 (30.8%)	
	80-100%	16 (34.0%)	8 (61.5%)	

4. DISCUSSION

This study focused on evaluating the differences in satisfaction among patients with single implant versus two implant-supported mandibular overdentures (MOs). It sought to determine which implant configuration provided greater comfort and functionality. By assessing patient feedback, the research aimed to identify any significant variations in overall satisfaction and quality of life.

The study subjects were patients rehabilitated with single implant-supported mandibular overdenture with ball attachment and those rehabilitated with two implant-supported mandibular overdentures with either ball or bar attachment. Based on the study results, there were no significant differences in the ease of cleaning, overall appearance, visibility and plane of mandibular teeth, ability to speak, comfort and chewing efficiency between the two groups of patients. These findings were in corroboration with the studies conducted by Hauck KE et al (7), Khoshhal M et al (8), Bhat S et al (9) and Alqutaibi AY et al (10). However, the findings did not correlate with the findings of the study conducted by Paleari et al (6), who found a significant difference in patient satisfaction and masticatory performance between the two groups.

The study results revealed significant differences in the satisfaction of retention between single and two-implant supported MOs ($p < 0.05$). Moreover, satisfaction in retention was better reported in patients with bar-supported two implant mandibular overdentures as compared to ball attachment supported MOs ($p < 0.001$). These findings were consistent with the study conducted by Paleari et al (6), Alsourori AA et al (11) and Sabouri A et al (12). This may be attributed to the fact that movement of the prosthesis may occur around the central axis leading to development of sagittal, transverse, and vertical rotational axes in a single implant-supported mandibular overdenture with ball attachment (13). However, the findings did not match with the findings of the study conducted by Van Kampen F et al (14) who did not find any difference in retention forces among bar-clip, ball, and magnetic attachments in mandibular implant overdenture treatment.

The results of the study also showed significant differences in the denture stability between the two groups of patients (single versus two implant) ($p < 0.05$). These results were in accordance with the study conducted by Sabouri et al (12). These results may be accredited to more lateral movements permitted by ball attachments as compared to bar attachments. This fact was also highlighted by Alqutaibi AY and Kaddah AF (15).

Regarding ease of cleaning, although the results were statistically insignificant between the two groups, further association revealed that satisfaction of patients with two implant-supported MOs with bar attachment was lower as compared to those with ball attachment ($p = 0.009$). Similar findings were reported by Laverty DP et al (16) and Gray D and Patel J (17). This may be credited to the design of the bar attachments requiring a higher level of manual dexterity for cleaning.

Out of the various key aspects evaluated, only retention and denture stability demonstrated significant differences between single and two implant-supported MOs, making single implant-supported mandibular overdenture a feasible, effective, and affordable treatment choice for geriatric patients. This treatment modality can offer improved function, comfort and satisfaction for edentulous patients requiring prosthetic rehabilitation as compared to conventional complete dentures as depicted in the studies conducted by Mathew JE et al (4) and Nogueira TE et al (18). Numerous studies have objectively compared satisfaction levels between single and two implant-supported MOs (6,7), but, subjective comparisons were not much reported. Therefore, this study was undertaken which concluded that single implant-supported MOs showed

comparable results with two implant-supported MOs and can be considered as an alternative treatment option to two implant-supported MOs, particularly in patients with low economic status.

The main limitation of this study was a relatively smaller sample size which may constrain the ability to generalize the results beyond the studied sample. A small participant pool may have impacted the study's power analysis, which was determined to be 80%. Increasing the number of participants could have enhanced the statistical power. Further research may be advocated on a larger patient population to strengthen the study's conclusions.

5. CONCLUSION

Within the limitations of this study, it can be concluded that satisfaction index of patients was similar between single and two implant-supported mandibular overdentures with no significant differences in most of the key aspects evaluated except satisfaction in retention and denture stability which was higher in two implant-supported MO. Moreover, patient satisfaction in retention was higher with bar-supported two implant MO and in regards to ease of cleaning, satisfaction was rated higher with single implant-supported MO.

Both treatment modalities demonstrated acceptable levels of patient satisfaction, suggesting that single-implant overdentures can be a viable and cost-effective alternative for patients with financial or anatomical limitations. However, for those prioritizing retention and stability, the two-implant overdenture, particularly with a bar attachment, may offer superior benefits. Further long-term studies with larger sample sizes and objective clinical assessments are recommended to validate these findings and assess additional factors, such as bone resorption, peri-implant tissue health, prosthetic complications, and overall oral health-related quality of life. A comprehensive evaluation of these parameters will aid in optimizing treatment planning and ensuring better patient-centred outcomes in implant-supported overdentures.

REFERENCES

- [1] de Souza RF, Ribeiro AB, Oates TW, Feine JS. The McGill denture satisfaction questionnaire revisited: exploratory factor analysis of a binational sample. *Gerodontology*. 2020;37(3):233-43.
- [2] Thomason JM, Feine J, Exley C et al. Mandibular two implant-supported overdentures as the first choice standard of care for edentulous patients- the York Consensus Statement. *Bri Dent J*. 2009;207(4):185-6.
- [3] Kutkut A, Bertoli E, Frazer R, Pinto-Sinai G, Hidalgo RF, Studts J. A systematic review of studies comparing conventional complete denture and implant retained overdenture. *J Prosthodont Res*. 2018;62(1):1-9.
- [4] Mathew JE, Kurian N, Gandhi N, Daniel AY, Roy N, Varghese KG. Comparative evaluation of masticatory efficiency, clinical performance, and patient satisfaction of single implant-retained mandibular overdenture versus conventional complete denture: A prospective in vivo study. *J Indian Prosthodont Soc*. 2024;24(1):61-8.
- [5] Mahoorkar S, Bhat S, Kant R. Single implant supported mandibular overdenture: a literature review. *J Indian Prosthodont Soc*. 2016;16(1):75-82.
- [6] Paleari AG, Oliveira NM, Marin DO et al. One-year prospective clinical study comparing patient satisfaction and masticatory performance of mandibular overdentures supported by one versus two implants. *J Appl Oral Sci*. 2018;26:e20160628.
- [7] Hauck KE, Trentin MS, Skiba TH, Shibli JA, De Carli JP. Clinical and satisfaction outcomes of using one or two dental implants for mandibular overdentures: preliminary short-term follow-up of a randomized clinical trial. *Int J Implant Dent*. 2021;7:1-10.
- [8] Khoshhal M, Vafaee F, Atibeh EA et al. Evaluation of satisfaction level in patients with mandibular implant supported overdentures. *J Dent Res*. 2016;8(4):e29395.
- [9] Bhat S, Chowdhary R, Mahoorkar S. Comparison of masticatory efficiency, patient satisfaction for single, two, and three implants supported overdenture in the same patient: A pilot study. *J Indian Prosthodont Soc*. 2016;16(2):182-6.
- [10] Alqutaibi AY, Esposito M, Algabri R et al. Single vs two implant-retained overdentures for edentulous mandibles: a systematic review. *Eur J Oral Implantol*. 2017;10(3):243-61.
- [11] AlSourori AA, Mostafa MH, Kaddah AF, Fayyad AE, Al Adl AZ, Swedan MS. Impact of single implant versus two-implant mandibular retained overdentures on retention and success rate in totally edentulous patients. A randomized controlled clinical trial. *J Osseointegrat*. 2018;10(3):79-86.
- [12] Sabouri A, Barjini N, Tabatabaian F. Comparison of the effect of ball and bar attachment designs on retention

and stability of mandibular implant-supported overdentures. *J Dent Sch* 2017;35(1): 41-52.

- [13] Misch CE. Dental Implant Prosthetics. In Treatment options for mandibular implant overdentures. 1st ed. St. Louis Mosby 2005. pp. 206-51.
 - [14] Van Kampen F, Cune M, Van Der Bilt A, Bosman F. Retention and postinsertion maintenance of bar-clip, ball and magnet attachments in mandibular implant overdenture treatment: an in vivo comparison after 3 months of function. *Clin Oral Implant Res*. 2003;14(6):720-6.
 - [15] Alqutaibi AY, Kaddah AF. Attachments used with implant supported overdenture. *Int Den Med J Adv Res* 2016;2:1-5.
 - [16] Laverty DP, Green D, Marrison D, Addy L, Thomas MBM. Implant retention systems for implant-retained overdentures. *Br Dent J* 2017;222(5):347-59.
 - [17] Gray D, Patel J. Implant-supported overdentures: part 1. *Br Dent J* 2021;231(2):94-100.
 - [18] Nogueira TE, Dias DR, Leles CR. Mandibular complete denture versus single-implant overdenture: a systematic review of patient-reported outcomes. *J Oral Rehabil*. 2017;44(12):1004-16.
-