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Literature Review

Patient Satisfaction with Implant and Implant Supported Prosthesis: A Literature Review

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Abstract

Introduction: Dental implant as a form of treatment for missing teeth has become desirable due to its ability to preserve the alveolar bone and resistance to dental caries as well as its high success rate, predictability, increased awareness among patients as well as its increased acceptance as a treatment option for missing tooth/teeth among patients. We could restore normal lifestyles that the patients once had like proper mastication, bringing back their aesthetic they wanted, normal speech and so on. The literature reviewed within this paper all studied the review patient satisfaction on implant and implant supported prosthesis.

Methodology: Previous articles, literature and research studies by computer searching which studied the patient satisfaction on implant and implant supported prosthesis were reviewed. A MEDLINE search and a manual research were conducted from 2010 to 2022 to locate related articles on the topic.

Results: Almost 100% studies reviewed regarding the patient satisfaction on dental implant treatments showed significantly achievable results in aspects of overall satisfaction, masticatory efficiency, aesthetics, comfort, speaking and phonation and high OHRQoL. All patients were strongly satisfied with their overall implant therapy and they were more comfortable after treatment compared than before as their quality of life has significantly increased after surgery.

Conclusion: In conclusion, most of the related studies showed that dental implants have delivered reliable and satisfactory outcomes during various aspects of life assessment. Majority of the rehabilitated implants patients showed a significant improvement in masticatory efficiency, aesthetics, phonation, comfort, self-esteem, and the quality of life.

Keywords: *Follow Up Implant Treatment; Implant Prosthesis; Prosthesis; Quality of Implant Treatment; Implant Therapy and Dental Implant; Oral Health Quality of Life; Patients' Satisfaction on Implant Prosthesis*

Background

Dental prosthesis are functional and esthetic devices that play a crucial role. They are constructed from synthetic materials and are utilized to repair damaged or imperfect teeth, or to replace one or more missing teeth. The branch of dentistry responsible for the restoration of defective tooth and maintenance of oral function, appearance and comfort by use of prostheses [1]. There are 2 types of dental prosthesis available in Malaysia. i. Removable dental prosthesis is prosthesis which replaces the soft tissue and teeth and commonly referred as dentures which can be removed by the patients [2]. ii. Fixed dental prosthesis which is designed to replace missing teeth permanently. Fixed prosthesis provides greater comfort, better good grip, and better firmness than removable prosthesis. The types of fixed dentures include implants, bridges, crowns,

veneer, onlay, inlay and hybrid prostheses [2,3]. Dental implants are artificial tooth roots to replace missing teeth. They are able to provide permanent solution for improving function and esthetics because they are fused to the bone (osseointegration). Dental implants are made of titanium alloy - materials that are compatible with human bone and tissue [4]. Professor Branemark of Sweden during the 1960s introduced and established the idea of osseointegration acting as the primary indicator for success of dental implants. Osseointegration is considered a criteria for the clinical success of endosseous dental implants [5-7]. The integration with the bone provides a stable and secure foundation for dental prostheses [2]. Dental implants are regarded as premium solutions for tooth replacement.

Dental implants are designed to be long lasting while preserving jaw bone density and prevent bone loss thereby maintaining natural shape of your face and preventing further oral health care issues. There are many advantages and benefits of having dental implants [8,9]. a) High success rate: Dental implants have a high success rate of over 95%. b) Durability: Implants are very durable and will last many years. c) Improve speech and comfort: Tooth implants replicate the appearance, sensation and performance of your natural teeth. d) Natural appearance: Dental implants prevent facial collapse by integrating jaw bone, keeping the bone active and preserving a more natural facial shape. This procedure enhances facial features by providing better support for the cheeks and lips, leading to improved facial symmetry and proportions. e) Improve mastication: Sliding dentures can make chewing difficult. f) Improved self esteem: Dental implants can give you back your smile and help you feel better about yourself. According to the Oral Health Division of Malaysia, 2010, in Malaysia, edentulism has become a problem among adults and the elderly with only 76.9% and 23.9% of 35 - 44 and 60 - 70 age groups respectively having at least 20 functional teeth [10]. The loss of teeth will also negatively impact their quality of life where elderly patients may face difficulties in mastication, phonation, pain and discomfort as well as participating in social interactions can have a positive impact on their overall health. OHRQoL is a multifaceted concept encompassing a person's subjective assessment of their oral health, functional well-being, emotional well-being and personal expectations [12-14]. There is much room for improving the performance of implants. If advanced implants and bone implant materials are developed and launched, experts generally agree that future prospects for implants are bright. For example, a dental implant navigation system can be used to integrate implanting instruments, medical imaging, optical positioning devices, and preoperative guided implants at the planned position [15,16].

Aims and Objectives

Several studies have been conducted to evaluate patients' satisfaction with endosseous implant-supported prostheses using a number of parameters including mastication, aesthetics, speech, comfort, and overall satisfaction, while other studies have used quality of life questionnaires such as the oral health impact profile and the geriatric oral health assessment index to evaluate patient satisfaction and improvement in oral-health-related quality of life and most of the patients satisfied with the outcome of implants [17]. There are various factors that contribute to satisfying patients such as ability of doctors, friendliness of staff members of the hospital, beautiful interior, etc. Ultimately patient satisfaction will be highest when their needs are thoughtfully addressed and medical services exceed their expectation [5]. The aim of this study is to review patient satisfaction on implant and implant supported prosthesis. Key words used for electronic database searches were the following: follow up implant treatment, implant prosthesis, prosthesis, quality of implant treatment, implant therapy and dental implant, oral health quality of life, patients' satisfaction on implant prosthesis. The electronic databases used were *Journal of the American Dental Association*, Research gate, PubMed, Allied academies, *Journal of Education and Portal MyHealth*, ScienceDirect, NCBI, *International Journal of Applied Dental Science, Dentistry and Medical Research, Journal of Prosthodontics, Pathology, Dental Material Journals*, Hindawi, PMC, Elsevier. Inclusion criteria were the following: 1. Scientific articles and journals available in the internet. 2. Reports published from 2010 to 2022. 3. Studies identified by computer searching. 4. Studies which have been published in English. Exclusion criteria were the following: 1. Studies which were not published in English. 2. Studies where the full article was not available. 3. Hand searching of journals, reviews, letters and editorials. 4. Reports published before 2010.

Selection of studies and data extraction: Three researchers independently screened titles and abstracts and the contents to confirm an eligibility criteria match. The data's collected include

general information (name of authors, country, number of participants, type of study, objectives) and outcome measures (knowledge %, attitude %). Duplicate studies were eliminated after the three researchers compared their lists. Any disagreements regarding the inclusion of a study were resolved through discussions and consensus among the study authors.

Review Results

Authors	Year, Place	Masticatory Efficiency	Aesthetic	Comfort	Speech and Phonation	OHRQoL
Mathieu F., Dominique Aubazac., *et al.*	2013, France	✓	✓	✓	✓	✓
David Joseph, Sébastien Gallina., *et al.*	2014, France	✓		✓		
Bruno César, Ana Luísa., *et al.*	2014, Brazil	✓	✓	✓	✓	✓
DR Prithviraj, Vibhor Madan., *et al.*	2014, India*	✓		✓	✓	
M. Khursheed Alam, Shaifulizan AR., *et al.*	2015, Malaysia	✓	✓	✓		
Lucia, F. Estevan., *et al.*	2015, Spain	✓	✓	✓		✓
Monalisa K., Denise Piotto., *et al.*	2016, Brazil	✓		✓		✓
Shane J. J. McCrea	2017, UK	✓	✓	✓		
Sabiha Zelal Ülkü, Filiz Acun Kaya., *et al.*	2017, Turkey	✓		✓	✓	
Jung Su O	2017, S. Korea	✓		✓	✓	✓
Fernandes Costa AN, Rodrigues TC., *et al.*	2017, Brazil			✓		✓
Naser Sargolzaie., *et al.*	2017, Iran	✓		✓	✓	✓
Zaid Ali, Sarah R Baker, Shirin Shahrbaf., *et al.*	2018, UK*					✓
Sameh Attia, Thaqif EK., *et al.*	2019 German	✓	✓		✓	✓
Moustafa Abdoul, M. Elgamal., *et al.*	2019, Egypt	✓				✓
Éber Coelho Paraguassu, Anneli Celis Mercedes	2019, Brazil	✓			✓	
Gianmaria D'Addazio, Edit Xhajanka., *et al.*	2021, Albania	✓	✓	✓	✓	✓
Yan Wang, Daniel Bäumer., *et al.*	2021, German	✓	✓	✓	✓	✓
Ho-Yan Duong, Andrea Roccuzzo., *et al.*	2022, Switzerland*	✓	✓	✓		✓
Salwa Omar, Abdullah S., *et al.*	2022, Saudi Arabia	✓	✓	✓	✓	✓

Depend on type of prosthesis

Authors	Implant-Supported Prosthesis				Conventional Denture
	Single Crown	Fixed Partial/ Bridge (IFPD)	Fixed Complete (IFCD)	Implant Overdenture (Snap-in)	
Mathieu F., Dominique Aubazac., *et al.*	ME: ++++ E: ++++ C: ++++ SP: ++++ O: ++++	ME: ++++ E: ++++ C: +++ SP: ++++ O: ++++	ME: ++++ E: ++++ C: +++ SP: ++++ O: ++++	ME: ++++ E: ++++ C: +++ SP: +++ O: ++++	-
Bruno César, Ana Luísa., *et al.*	ME: ++++ E: ++++ C: ++++ (highest) SP: ++++ O: ++++	ME: ++++ E: ++++ C: ++++ SP: ++++ (highest) O: ++++	ME: ++++ E: ++++ C: +++ SP: ++ (lowest) O: ++++	ME: ++++ E: ++++ C: +++ (lowest) SP: +++ O: ++++	-

Sabiha Zelal Ülkü, Filiz Acun Kaya., *et al*.	-	-	ME: ++++ C: ++++ SP: ++++	ME: ++++ C: +++ SP: +++	-
Fernandes Costa AN, Rodrigues TC., *et al*.	ME: ++++ C: ++++ SP: +++ O: ++++			ME: ++++ C: +++ SP: ++++ O: ++++	-
Lucia, Fernandez Estevan., *et al*.	-			ME: ++++ E: ++++ C: ++++ O: ++++	ME: +++ E: +++ C: ++ O: ++
Zaid Ali, Sarah R Baker., *et al*.	ME: ++++ C: ++++ O: ++++				ME: +++ C: ++ O: +++
Éber Coelho Paraguassu, Anneli Celis Mercedes	ME: ++++ E: ++++ C: ++++ SP: ++++ O: ++++				ME: +++ E: +++ C: ++ SP: +++ O: +++
Gianmaria D'Addazio, Edit Xhajanka., *et al*.	-	-	-	ME: ++++ E: ++++ C: ++++ SP: ++++ O: ++++	ME: +++ E: +++ C: +++ SP: +++ O: +++
Ho-Yan Duong, Andrea Roccuzzo., *et al*.	ME: ++++ E: ++++ C: ++++ SP: ++++ O: ++++				ME: +++ E: +++ C: +++ SP: +++ O: +++
Salwa Omar, Abdullah S., *et al*.	-	-	-	ME: ++++ E: ++++ C: ++++ SP: ++++ O: ++++	ME: +++ E: ++++ C: +++ SP: +++ O: +++
ME - Masticatory Efficiency, E - Esthetics, C - Comfort, SP - Speech and Phonation, O - OHRQoL ++++ Extremely Satisfied +++ Very Satisfied ++ Satisfied + Slight Satisfied					

Discussion

The purpose of this study was to review patient satisfaction on implant and implant supported prosthesis. Patient overall satisfaction of dental implants includes masticatory efficiency satisfaction, aesthetic satisfaction, speaking and phonation satisfaction and comfort. Hence, the aim of our study limits the satisfaction of dental implant patients regarding their treatment. Due to this, the present literature review aimed to study in detail all available studies which fit the inclusion criteria regarding satisfaction of patients that undergo dental implant treatments.

Masticatory efficiency: All the articles reviewed mentioned that masticatory efficiency was improved after implant treatment.

There were no statistically significant associations in regard to the items for "chewing function," in regards for type of implant prostheses [18,20,26,27,34]. Implant prostheses also provide greater retention and stability, thereby providing the user with greater masticatory efficiency compared to conventional denture [23,29,32-35]. Continuous bone resorption may be the reason that the conventional denture prosthesis has lower satisfaction and quality of life as this decreases the stability and retention of the prosthesis [32,34,35].

Aesthetic: When a dental implant case is planned, there are important aesthetic considerations. The dental restoration must not only be aesthetically pleasing but also the supporting bone and gingival tissue look natural in both shape and color [38]. Majority of the studies concluded that implant treatment produced a significant improvement in patients' satisfaction regarding aesthetics, eating, degree of comfort, and phonetics, as well as general satisfaction [40]. However one of the study by Samesh Attia from German described all the implant patients were very satisfied with their esthetic, except in a patient who was dissatisfied due to the visibility of implant material through the mucosa [30]. It is crucial to assess esthetic outcomes differently for partially and fully edentulous patients, as those requiring a single unit crown in the front maxilla often have higher expectations than fully edentulous patients needing implant supported prosthesis [27,24].

Comfort and function: All the articles showed highly improvement in comfort and function after implant placement. In other hand, Fernandes-Costa AN., *et al*. mentioned that patients presented a high satisfaction for comfort and function, regardless of age, duration of use and the type of prosthesis used. However, increased attention should be given by professionals in relation to women's expectations due to higher psychological discomfort and functional limitations [27]. Another finding by Bruno César., *et al*. was described in a observational study in Brazil showed "Comfort" was associated significantly with the number of implants as single implant has higher comfort and function compared to more number of implants. An increase in the number of implants leads to greater hygiene challenges compared to natural teeth and conventional dentures [20]. Implant prostheses provide greater comfort compared to conventional dentures, as they are designed to look alike without the concern of displacement [23,29,33].

Speech and phonation: Dental implants offer the advantage of improving the speech clarity, as they are securely anchored and do not slip like dentures, allowing for more natural and precise pronunciation [17]. Most of the articles stated that patients with implant and implant supported prosthesis positively enhanced their speech and phonation during speaking [5,20,26,28,30,33,35]. Attia S., *et al*. stated that pronunciation ability and aesthetics were acceptable for all patients [30]. In 2021, Yan Wang., *et al*. stated that 100% of the patients were strongly satisfied with their phonetics [34]. In another studies, F. Awadalkreem., *et al*. demonstrated that patients' satisfaction with speech significantly improved with basal implants. However, two patients in the study reported issues with phonation when pronouncing the letter "S" [17]. The maximum satisfaction score was obtained from patients with fixed partial dentures followed by single crowns, overdentures and complete fixed dentures.

Oral health related quality of life (OHRQoL): Most of the articles reviewed highly achieved OHRQoL. According to the evidence stated by Naser Sargozaie., *et al*. and Ho-Yan Duong., *et al*. the quality of life significantly improved. Emotional well-being, enjoyment of social interactions and job related activities also saw noticeable enhancement, although quality of life related to sleep and rest didn't show improvement [28,34]. Patients with implant implants presented significantly high level of satisfaction on their quality of life than patients rehabilitated with conventional complete removable prostheses [23,29,32-35].

Conclusion

In this literature review, most of the related studies showed that dental implants proven to have promising and consistent results in terms of patient satisfactions, improvement in various aspects of quality and various aspects of life assessment. Majority of the rehabilitated implants patients showed a significant improvement in masticatory efficiency, aesthetics, phonation, comfort, self-esteem, and the quality of life. Implant supported prostheses also showed superior satisfaction in OHRQoL compared to conventional prostheses.

Only few of the articles reported patients' felt discomfort and had phonation issues. Therefore, ongoing efforts to address and improve these issues are essential for implant practitioners.

Clinical Significance

So, the continuing efforts to make improvements about these problems are needed for the implant practitioners. Implant supported prostheses also showed superior satisfaction in OHRQoL compared to conventional prostheses.

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