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EPA Consensus Project Paper: Do Implant-Supported/Retained Prostheses Improve the Quality of Life of Patients with Intraoral Maxillofacial Defects? – A Systematic Review

Keywords

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ABSTRACT

Background: There is limited evidence available regarding patient satisfaction and quality of life assessment in patients with intraoral maxillofacial defects managed with maxillofacial prostheses. Objectives: This systematic review aims to understand the impact of intraoral implant prostheses in improving the quality of life in patients with intraoral maxillofacial defects/abnormalities. Methods: A comprehensive search was performed of nine electronic databases from January 1970 to August 2022. Hand searching of the reference lists of the included papers and of relevant journal publications between 2012 and 2022 was also undertaken. Key information was extracted from included studies alongside quality and risk of bias assessments. Results: The systematic review encompassed a total of seven studies, comprising five retrospective and two prospective investigations, with one of the prospective studies being a randomised clinical trial. The evaluation of the risk of bias and quality assessment revealed heterogeneity in the results, preventing meaningful comparisons among the included studies. Conclusion: Within the limitation of the systematic review, there is limited evidence to suggest that implant prostheses improve the quality of life in patients with intraoral maxillofacial defects or abnormalities.

INTRODUCTION

Defects in the maxillofacial region can be intraoral involving the maxilla, soft palate or mandible, or they can be extraoral, involving the ear, orbit, nose, or a combination of all of the above.[1] These defects can be due to developmental anomalies, trauma, cancer or the sequelae of ablative cancer surgeries. They can lead to an alteration in both facial and dental aesthetics, as well as function. This may have a profound psychological impact on a patient affecting their self-confidence, self-worth, and ability to socially interact.[2]

Maxillofacial prosthodontics is a sub-specialty of Prosthodontics that involves rehabilitation of patients with congenital or acquired defects in the maxillofacial region.[3] Prostheses are often needed to replace missing areas of bone or soft tissue and restore oral functions such as swallowing, speech and chewing.[4] In other instances, a prosthesis for the face or body may be indicated for cosmetic or psychosocial reasons.[4] A multidisciplinary approach is often required to evaluate the psychological status of the patient, and provide a treatment strategy to alleviate the impact of the maxillofacial defect on overall quality-of-life.

One of the common consequences of intraoral maxillofacial defects is altered hard and soft tissue anatomy as well as missing teeth. All three of these can lead to functional and aesthetic impairment and can have a negative psychosocial impact.[5] It is well recognised that patients with fewer than 20 natural teeth have worse Oral Health Related Quality of Life (OHRQoL) than those with 20 teeth or more.[6] Prosthodontic treatment in patients with intraoral maxillofacial defects, including implant-supported prostheses and non-implant supported prostheses, such as obturators and conventional bridgework, can replace missing teeth and lost hard, and soft tissue structures. This can improve appearance and function, prevent undesirable tooth movements, seal the oral cavity preventing the unwanted escape of air and food, and potentially improve OHRQoL.[7]

Traditionally, the outcome measures for the success of prosthodontic replacement of missing teeth focused on masticatory efficiency, continued prosthesis use, technical failure and biological complications.[8-12] Whilst these are important measures for success, they often fail to consider the patient perspective on their own OHRQoL. This can be addressed through the use of patient reported outcome measures (PROMs) which consider the patient's own assessment of aesthetics, function and psychological well-being. A number of different OHRQoL measures have been described in the literature including the Oral Health Impact Profile (OHIP), Global Oral Health Assessment Index (GOHAI), Oral Impacts of Daily Performance (OIDP), and UK Oral Health-Related Quality of Life Measure (OHQoL-UK).[13-17] These measures can be used to demonstrate improvement in OHRQoL when they are collected before and after prosthodontic treatment.

Previous systematic reviews have suggested that rehabilitation with dental implants in edentulous and partially dentate patients can improve OHRQoL,[18-24] but OHRQoL outcomes for patients with intraoral maxillofacial defects who are rehabilitated with implant-supported/retained prostheses and non-implant supported/retained prostheses have not previously been comprehensively reviewed. It is important that we review published outcomes as implant supported prostheses are more expensive and often involve multiple surgical procedures with associated morbidity. This information will also help patients make a more educated choice about their preferred treatment modality.

The purpose of this systematic review was to investigate whether implant supported/retained prostheses improved oral health related quality-of-life in patients with intraoral maxillofacial defects when compared with non-implant supported/retained prostheses. The null hypothesis was that there was no difference in improvement in OHRQoL in patients with intraoral maxillofacial defects regardless of whether they were rehabilitated with implant supported/retained prostheses or non-implant supported/retained prostheses.

MATERIAL AND METHODS

This systematic review was conducted in compliance with principles proposed by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement and was registered with Prospero (CRD42022301873).[25] The PICO format was applied to define the research question in this review. The PICO are as follows:

P - the population was patients with intraoral maxillofacial defects or abnormalities.

I - the Intervention: implant-retained intraoral prostheses.

C - compared with non-implant intraoral prostheses.

O - the outcome was quality-of-life.

For inclusion in the review, studies had to include patients with acquired or developmental intraoral maxillofacial defects who underwent prosthodontic rehabilitation with either an implant supported/retained prosthesis or a non-implant-supported/retained prosthesis. Implant-supported/retained prostheses included implant-supported crowns (ISCs), implant-supported fixed partial dentures (IFPDs), and implant-retained removable partial dentures (IRPDs). Non-implant-supported/retained prostheses included tooth-supported fixed partial dentures (TFPDs), removable partial dentures (RPD) and complete dentures with or without an obturator component. Previous systematic reviews and meta-analyses, single or multiple group prospective randomised controlled (RCTs), non-randomised controlled trials, cohort studies, case series and case reports which were in English or had translations in English were included. Studies focusing on the rehabilitation of patients with extraoral maxillofacial defects, cross-sectional studies, narrative reviews and review protocols were excluded. A summary of the inclusion and exclusion criteria can be seen in Table 1.

A comprehensive literature search of nine electronic databases was conducted by the lead author (SN). The search terms and keywords used to search Medline via the OVID interface are presented in Table 2. This search strategy was modified to conform to the different databases with the assistance of a medical librarian. Searches were restricted to English language articles or articles with translation in English published from January 1970 - August 2022. A summary of the electronic databases searched, and the number of articles obtained from each database for screening can be seen in Figure 1. Additional literature was sought by

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Table 1. A summary of the inclusion and exclusion criteria used in this systematic review.

Inclusion criteria	Exclusion criteria
1. Patients with intraoral maxillofacial abnormalities/defects	1. Patients with extraoral maxillofacial abnormalities/defects
2. English language or English translation available	2. Non-English language or no English translation available
3. Full-text article available	3. Full-text article unavailable
4. Systematic reviews and meta-analyses, single or multiple group prospective randomised controlled (RCTs), non-randomised controlled trials, cohort studies, case-control studies, case series and case reports	4. Cross-sectional studies, narrative reviews and review protocols 5. Animal studies

Table 2. Systematic review search terms and keywords for Medline via OVID.

Search terms and keywords
(((maxillofacial.mp. AND (abnormalit*.mp. OR defect*.mp. OR trauma*.mp. OR syndrome*.mp.)) OR cleft palate. mp. OR maxillectomy.mp. OR hemifacial microsomia.mp.) AND (zygoma*.mp. OR implant*.mp. OR prosthes*.mp. OR obturator*.mp. OR denture*.mp. OR bridge*.mp.) AND (prognos*.mp. OR patient satisfaction.mp. OR quality of life. mp. OR survival.mp. OR treatment outcome*.mp. OR success*.mp. OR complication*.mp. OR failure*.mp.)

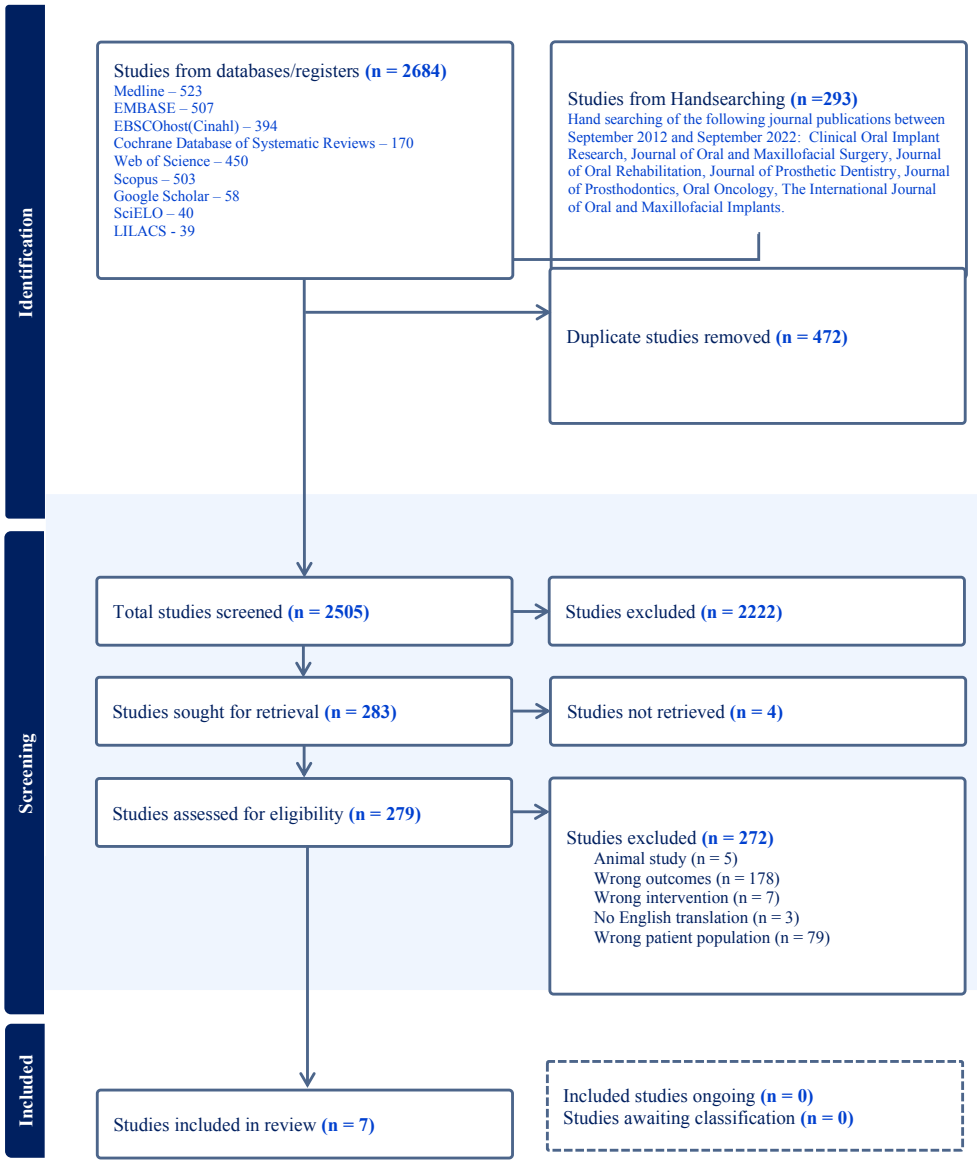

Figure 1: PRISMA flow diagram of search strategy and outcomes. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-analyses.

hand searching of the journal publications between September 2012 and September 2022, listed in Figure 1, which was undertaken by author KA.

The studies identified through the search strategy were uploaded into Covidence and duplicate studies were removed. Two reviewers (SN and JV) independently screened the titles and abstracts of all articles to select those meeting the inclusion criteria for full text analysis. Any disagreements were resolved through discussion with a third reviewer (KB). Articles selected for full text analysis were again independently assessed for final inclusion by two reviewers (SN and JV) to confirm that they did meet the inclusion criteria. Any disagreements were again resolved through discussion with a third reviewer (KB).

Key information was extracted from the final included studies including the participant characteristics (age and type of maxillofacial defect), sample size, study design, type of prostheses used, and number of implant fixtures placed (if applicable). Data regarding the quality-of-life outcomes was also extracted and this included which prostheses the quality-of-life measurements were taken for, when quality-of-life was measured post-insertion of a prosthesis, how it was measured, and whether there was a reference for validation of the measurement method. Finally, a summary of the quality-of-life results was documented as well as if statistical analysis of the results was undertaken.

The quality and risk of bias of all studies meeting the inclusion criteria was independently assessed by two reviewers (KB and JV). Any disagreement was resolved by discussion with a third reviewer (SN). Case series and reports were assessed using guidelines published by Pierson *et al.*[26] The Newcastle-Ottawa scale[27] was used to assess the quality of non-randomised trials and the Cochrane Collaboration's risk of bias tool was used to assess the quality of randomised clinical trials.[28]

RESULTS

The search of the different electronic databases yielded 2684 potential studies. 293 studies were found through handsearching of publications between September 2012 and September 2022 in the journals listed in Figure 1. 472 articles were excluded for being duplicate studies and 2222 studies were excluded following an assessment of the study titles and abstracts (kappa score: 0.74). The remaining 283 studies were selected for full text analysis and of these, 4 studies could not be retrieved. Of the remaining 279 studies, 272 of these studies were subsequently excluded for one or more of the following reasons: wrong outcomes (failure to report pre-treatment and post-treatment OHRQoL outcomes), wrong patient population (extraoral prosthesis), wrong intervention i.e., no conventional prosthesis or no implant prosthesis arm, animal study, full text unavailable, and no English translation (kappa score: 0.68). This resulted in the identification of 7 studies for inclusion in this systematic review.[29-35] Figure 1 shows the PRISMA flow diagram of search strategy and outcomes.

A summary of the key study characteristics of all seven included studies can be seen in Table 3. Of the seven included studies, five were retrospective in nature[29,30,33-35], and two were prospective.[31,32] Only one of the prospective studies was a randomised clinical trial.[32] There was wide variation in the sample sizes in the included studies with four of the studies only having a sample size of between one and five patients,[29,30,33,34] whilst three of the studies had a sample size of greater than twenty patients.[31,32,35] Five of the studies included patients solely with acquired intraoral maxillofacial defects due to head and neck cancer[29-32,34] whilst two of the studies included patients with a congenital intraoral maxillofacial defect due to cleft lip and palate.[33,35] In six of the studies, the conventional prostheses (CP) provided were removable in nature and only one study[35] included patients with conventional tooth-borne fixed prostheses. Similarly, the implant-based prostheses (IP) provided in the majority of studies were removable in nature and only two studies included fixed implant-supported prostheses.[31,35] There was large variation in the manufacturer and type of implant fixtures placed across the studies, with one study,[34] failing to mention the type of implant fixtures placed. Only one study included patients rehabilitated using zygomatic implants.[33]

All studies except Savoldelli *et al.*[35] and Niimi *et al.*[34] used recognised oral health related quality-of-life measurement tools to assess outcomes. Niimi *et al.* measured masticatory function using a questionnaire as a surrogate outcome for quality-of- life and Savoldelli *et al.* measured aesthetics using an implant crown aesthetic index as a surrogate outcome for quality-of-life. Five of the seven studies[29,31-34] measured quality-of-life on the same set of patients, i.e., both with an existing or new conventional prosthesis and again post-insertion of an implant-supported/retained prosthesis. Two studies measured quality-of-life pre-treatment on all patients and then post-treatment after insertion of either an implant-based prosthesis or a conventional prosthesis.[30,35]

Table 4 summarizes the quality-of-life outcomes. Only two studies found a statistically significant difference in quality-of-life between conventional prostheses and implant-supported/retained prostheses.[31,32] Both these studies favored implant-based prostheses over conventional prostheses for improved quality-of-life of patients with intraoral maxillofacial defects following rehabilitation. Four studies[29,30,33,34] did not carry out any statistical analysis to compare pre-treatment and post-treatment quality-of-life outcomes, whilst Savoldelli *et al.*[35] did carry out statistical analysis to compare the results of both groups but did not find any significant difference.

The risk of bias assessments for all included studies can be seen in Tables 5, 6 and 7. Kumar *et al.*[32] which was the only randomised clinical trial included was assessed using the Cochrane risk of bias tool and was judged to have an overall low risk of bias. The two non-randomised trials were assessed

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Table 3. Key characteristics of the final included studies:

Author	No. of patients	Age (Mean)	Type of Defect	Type of prostheses	No. of implants	Type of implants	Study Type
Cassoni (2020)	5	52	Cancer (3 maxilla, 2 mandible)	2 CP (partial or complete removable denture) and 3 IP	18 implants in 3 patients	Porous - conventional	Retrospective case series
Kumar (2016)	52	35.4	Cancer (mandibular defects with reconstruction by fibula free flap)	Pre-treatment 52 CP (removable dentures) Post-treatment 52 IP (2 or 4 implant-supported overdentures)	156 implants in 52 patients	Straumann Standard Plus Implant SLActive 4.1x10mm	Prospective, parallel designed, randomised clinical trial
Niimi (1993)	3	68.3	Cancer (maxilla, hemi-maxillectomy defect)	Pre-treatment CP (removable obturator) Post-treatment IP (3 or 4 implant-retained removable obturator)	12 implants in 3 patients	No mention	Retrospective case series
Al-Salehi (2007)	1	73	Cancer (maxilla, hemi-maxillectomy defect)	Pre-treatment CP (removable obturator) Post-treatment IP (3 implant-retained overdenture)	4 implants in 1 patient	Branemark, conventional	Case Report
Savoldelli (2022)	40	20.72	Cleft lip and palate	7 No prosthesis 7 CP (5 tooth borne fixed prostheses, 2 removable dentures) 26 IP (implant-supported crowns/bridges)	40 implants in 26 patients	Straumann BL Zimmer TSV	Retrospective cohort study
Landes et al (2013)	4	56.5	Cleft lip and palate	Pre-treatment 2 NP Pre-treatment 2 CP (removable dentures) Post-treatment 4 IP (implant-retained obturators +/- telescopic crowns on natural teeth	11 implants in 4 patients	1 Branemark Speedy 4x13mm 1 Xive 3.4x11mm 9 Zygoma fixture, Nobel Biocare	Retrospective case series
Karayazgan-Saracoglu (2017)	22	65.5	Cancer (marginal mandibular defects)	Pre-treatment 22 CP (removable dentures -11) 11 NP. Post-treatment 22 IP (12 implant retained overdenture and 12 implant-supported bridges)	64 implants in 22 patients	Straumann AG Tissue Level	Prospective, non-randomised clinical trial

(Index: CP – Conventional prosthesis; IP – Implant -supported/retained prosthesis; NP – No prosthesis.)

as being high quality using the Newcastle-Ottawa scale with Savoldelli *et al*. achieving 7 out of 9 stars and Karayazgan-Saracoglu *et al*. achieving 9 out of 9 stars. Finally, the four case series/case reports[29,30,33,34] were assessed using the guidelines suggested by Pierson *et al*.[26] Three of these case studies/case reports were assessed as being at low risk of bias.

DISCUSSION

A comprehensive search of the literature was undertaken to answer a well-defined research question. The process adhered to established guidelines for conducting a systematic review.[25] A significant level of consensus was observed among reviewers, as reflected by interrater reliability scores ranging from 0.68 to 0.74. We can therefore be confident in the robustness of the findings.

Table 4. A summary of the quality-of-life outcomes of the included studies:

Study	Prosthesis with which quality of life measurement taken NP/CP/IP	When was quality of life measured?	How was quality of life measured?	Reference for quality-of-Life measurement tool	Quality of life results	Statistical Analysis of results
Cassoni 2020	NP, CP, IP	Measured pre-treatment prior to dental rehabilitation and post-treatment following dental rehabilitation with either CP or IP.	EORTC QLQ H&N 35	Bjordal 1999 (36)	Quality of life improved after prosthetic rehabilitation but unclear if this relates to conventional or implant rehabilitation	None
Kumar 2016	CP, IP	Measured on the same patients at baseline with CP, 6 months after insertion of IP, and 12 months after insertion of IP	EORTC QLQ-C30 OHIP H&N 35 DSI (Denture Satisfaction Index)	Aaronson et al 1993 (37) Bjordal et al 1994 (38) Slade 1997 (39) Vervoorn 1988 (40)	All patients had better functional outcomes when they were provided IP compared to CP in most parameters evaluated	p<0.05 favouring IP vs CP in all but two parameters (constipation and diarrhoea)
Niimi et al 1993	NP, CP, IP	Measured on the same patients with NP, after insertion of CP and after insertion of IP	Masticatory function was measured using a questionnaire.	Ueda 1993 (41)	Mastication with IP was better than with NP or CP	None
Al-Salehi 2007	CP, IP	Measured on the same patient after insertion of CP and 6 months after insertion of IP	OHIP-14	Allen 1999 (42)	Improvement between non-implant retained prosthesis and implant retained prosthesis with reduction in negative impacts and increase in positive impacts	None
Savoldelli 2022	NP, CP, IP	Each patient had a single mode of rehabilitation. One quality of life score was taken at the end of treatment (after 3 years of follow-up) and no pre-treatment score was taken.	Implant crown aesthetic index	Meijer et al 2005 (43)	No significant differences were observed between IP and CP	p>0.05
Landes 2013	NP, CP, IP	Measured on the same patients with no prosthesis, after insertion of CP and after insertion of IP	Subjective overall satisfaction evaluated using visual analogue scale (VAS) OHIP-14G (German version)	Hjermstad et al 2011 (44) Landes et al 2012 (45) John et al 2004 (46)	Post-treatment IP had higher overall satisfaction and decreased OHIP-14G	None
Karayazgan-Saracoglu 2017	CP, IP	Measured on the same patients after insertion of CP and 6 months after insertion of IP	Subjective overall satisfaction evaluated using visual analogue scale (VAS) OHIP-EDENT (Turkish version)	Hayes & Patterson 1921 (47); Freyd 1923 (48) Allen 2002 (49)	Patients rehabilitated with IP had a statistically significant decrease in the mean score of all post-treatment OHIP-Edent values	P<0.05 in the mean scores of all OHIP-Edent subscale values when comparing pre-treatment vs post-treatment

(Index: CP: Conventional prosthesis, IP: Implant-supported/retained prosthesis, NP: No prosthesis)

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Table 5. Risk of bias assessment for the included non-randomised trials, assessed using the Newcastle-Ottawa scale:

Study	Selection				Comparability	Outcome			Total Score
	Item 1	Item 2	Item 3	Item 4	Item 1 (2 stars available)	Item 1	Item 2	Item 3	
Savoldelli (2022)	*	*	*	*		*	*	*	7 out of 9
Karayazgan-Saracoglu (2017)	*	*	*	*	**	*	*	*	9 out of 9

(7-9 – high quality; 4-6 – high risk of bias; 0-3 – very high risk of bias)

Table 6. Risk of bias assessment for the included case reports/case series, assessed using guidelines published by Pierson et al.[26]

Study	Documentation	Uniqueness	Educational Value	Objectivity	Interpretation	Total score
Cassoni (2020)	1	0	1	0	1	3
Niimi (1993)	2	1	2	2	2	9
Al-Salehi (2007)	2	1	2	2	2	9
Landes et al (2013)	2	0	2	2	2	8

(9-10 – report is likely to be a worthwhile contribution to the literature; 6-8 – reader should be cautious about the validity and clinical value of report; 5 or less – report is of insufficient quality for publication.)

Table 7. Risk of bias assessment for Kumar et al (32), using the Cochrane Risk of Bias assessment tool.[28]

Cochrane Risk of Bias Summary for Kumar (2016)		
Selection Bias	Random sequence generation	The selected patients were randomly assigned to one of the two treatment groups by computer-generated block randomisation with a block size of four.
	Allocation concealment	The code was sealed in an envelope that was sequentially numbered and was opened only upon inclusion of the patient in the study. Participants were assigned to the respective groups based on the concealed allocation sequence.
Performance bias	Blinding of participants and personnel	Blinding of participants or personnel would not have been possible once the treatment was carried out.
Detection bias	Blinding of outcome assessment	Blinding of outcome is vicariously possible as the outcomes were patient reported outcomes.
Attrition bias	Incomplete outcome data	There was loss of some participants, and the reasons were explained. But there were enough participants in the end to provide a meaningful analysis.
Reporting bias	Selective reporting	The reporting was sound and there was equal numbers of patients in both arms.
Other bias	Other sources of bias	The inclusion criteria were very rigid and specific and so the results must be used cautiously as it cannot be generalised to every patient population who have had mandibular reconstruction.
Overall risk of bias		Low

This systematic review has identified a notable lack of evidence regarding the impact of implant-supported prostheses on the quality-of-life of patients with intraoral maxillofacial defects. This includes a lack of well-structured systematic reviews and randomised controlled trials. Some potentially eligible studies may have been excluded due to language restrictions (non-English) or the inability to translate them into English, introducing selection bias. Moreover, the sample sizes of participants in the included studies were generally small, which diminished the statistical power and heightened the risk of false negative (Type II) results. The results of this systematic review should therefore be interpreted with caution.

Considerable heterogeneity was evident among the included studies, as illustrated in Table 3, with variations observed in study designs and participant characteristics. This heterogeneity encompassed patient numbers, mean age, site, aetiology of patient defects, the prostheses employed for rehabilitation, and the number, make and type of implants utilised. This heterogeneity compromises both internal and external validity, making a meta-analysis unsuitable due to the lack of homogeneity in the data.[28]

In the evaluation of quality-of-life (QoL) outcomes, we observed variations in the timing of assessments following treatment, as outlined in Table 4. Additionally, there was a diversity in the selection of quality-of-life measurement tools and outcome parameters, which limits the ability to make direct comparisons. The use of the Visual Analogue Scale (VAS) permits statistically significant differences in distributions to be readily determined and is considered to be more accurate and sensitive, and subject to less distortion and bias compared with categorical scales.[50,51] VAS has been shown to be reliable and valid.[52] In general, the studies indicated an improvement in the quality-of-life in patients with intraoral maxillofacial defects who utilised implant-retained prostheses compared to those who relied on conventional prostheses or had no prostheses at all. However, it's important to note that only three of these studies conducted statistical analyses of QoL outcomes, with only two of them revealing a statistically significant benefit when implant-retained prostheses were used.

The included studies were generally assessed as being at low risk of bias although this finding should be considered alongside the study design. The non-randomised clinical trials were both considered to be of high quality *(Table 5*) although there were some concerns about the control group in the study by Salvodelli *et al*.[35] The case reports/case series was generally of good quality except for the case series by Cassoni *et al*.[30] due to missing information *(Table 6*).

Table 7 highlights the only included randomised controlled trial conducted by Kumar *et al*.,[32] which exhibited an overall low risk of bias. The authors clearly outlined the shortcomings of the study such as the specific selection criteria for inclusion, the younger patient population with mean age of 35.5 years and finally, the relatively short follow-up time. In spite of these shortcomings, the study was well structured, and the results can be generalised to the specific patient population. Greater weight should therefore be attributed to the results of this study given the low risk of bias and study design.

Patient-reported outcome measures (PROMs) serve as essential assessment tools, directly capturing data from patients to gauge various aspects of their health status, all of which significantly impact their quality-of-life. These facets encompass symptoms, functional capacity, and the physical, mental, and social dimensions of health. PROMs not only offer a snapshot of a patient's health status at a specific moment but can also be employed over time to measure improvement or deterioration in quality-of-life. This capability makes PROMs a critical instrument in research and clinical trials, enabling the rigorous assessment of intervention effectiveness and ensuring that outcomes hold genuine significance for patients, clinicians and policymakers thereby guiding informed decision-making.

It is notable that the studies included in this review used a variety of different PROMs. The use of multiple PROMs has previously been identified as a problem and validating these instruments holds significant importance.[53] Comparing these diverse tools and indices poses a formidable challenge, primarily due to the absence of consensus on a standardized outcome metric. Addressing this issue is crucial, as it can enhance the comparability of data and enable the meaningful synthesis of results from smaller sample sizes. This, in turn, can facilitate more robust and informative analyses.

The primary limitation of this systematic review lies in the considerable heterogeneity amongst the studies included, rendering the interpretation of results a challenging task. Consequently, the findings should be approached with caution and taken within the context of this limitation. Nonetheless, despite the limited nature of the evidence, there is some indication that intraoral implant prostheses may indeed offer an improved quality-of-life when compared to non-implant intraoral prostheses in the management of patients with intraoral maxillofacial defects or abnormalities. It is important to acknowledge, however, that these findings do not provide definitive rejection of the null hypothesis. There is therefore a need for further high-quality studies addressing this important issue.

CONCLUSION

Within the limitations of this systematic review, there is limited evidence to suggest that intraoral implant-supported/retained prostheses may have the potential to enhance the quality-of-life for individuals presenting with intraoral maxillofacial defects or abnormalities when compared with non-implant-supported/retained prostheses. However, it is imperative to underscore the limitations of the current research. To arrive at more robust conclusions, future studies should employ standardized outcome metrics, larger sample sizes, and stringent study protocols.

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