PICO SEARCH ASSIGNMENT WORKSHEET

Brief description of patient problem/setting (summarize the case very briefly)

A 72-year-old male with history of complete edentulism presents to clinic complaining of difficulty chewing while using conventional complete dentures. He reports that his dentures often become loose during meals which makes it difficult to eat meat, fruits, and raw vegetables. As a result, he has gradually started avoiding certain types of foods and relies more on softer foods. He denies pain or bleeding from his dentures. His primary care doctor discussed overdentures as a potential option. The patient would like to know whether overdentures would improve his chewing ability, nutritional status and quality of life compared with his current conventional dentures.

Search question: Clearly state the question (including outcomes or criteria to be tracked)

In edentulous adults, do implant-supported dentures (overdentures), compared with conventional complete dentures, improve masticatory function, nutritional status and quality of life?

Question type: What kind of question is this?

☐Prevalence	☐Screening	☐Diagnosis
☐Prognosis	**x Treatment**	☐Harm

Assuming that the highest level of evidence to answer your question will be meta-analysis or systematic review, what other types of study might you include if these are not available (or if there is a much more current study of another type)? Please explain your choices.

I would include randomized controlled trials (RCTs) because they provide a high level of evidence and help minimize bias through randomization. RCTs would be useful for assessing outcomes such as masticatory function, quality of life, patient satisfaction, and nutritional status in edentulous adults receiving implant-supported dentures compared with conventional complete dentures. I would also consider prospective cohort studies, especially if they provide long term follow up data on outcomes such as implant survival, maintenance requirements, and changes in nutritional status.

PICO search terms:

P	I	C	O
Edentulous adults	overdentures	Conventional complete dentures	Masticatory function/ chewing ability
	Implant-supported overdentures		Quality of life
	Dental implants		Patient satisfaction
	Implant- retained overdentures		Complications

			Nutritional status

Search tools and strategy used:

Database	Search terms used	# or results	Filters applied
PubMed	("overdentures" OR "dental implants") OR ("implant-retained overdentures") AND ("conventional complete dentures") AND ("quality of life") OR ("satisfaction") OR ("chewing ability") OR ("complications") OR ("nutritional status")	46	Last 10 years, full text, meta-analysis, randomized controlled trial, controlled clinical trials, systematic review, English, Humans, MEDLINE
EBSCO	("overdentures") OR ("implant-retained overdentures") AND ("conventional complete dentures") AND ("quality of life") OR ("satisfaction") OR ("chewing ability") OR ("complications") OR ("nutritional status")	4	Past 10 years, Peer Reviewed, Linked Full text
Google scholar	("edentulous adults") AND ("overdentures" OR "dental implants") OR ("implant-retained overdentures") AND ("conventional complete dentures" OR "complete dentures") AND ("quality of life") OR ("satisfaction") OR ("chewing ability") OR ("complications")	210	Time range: 2016-2026, Review articles, sort by relevance

	OR (“nutritional status”)		

For this PICO, I used PubMed, EBSCO, and Google Scholar to search for relevant literature. On PubMed, I used the search terms and filters listed above which yielded 46 articles. For each article, I reviewed the title and abstract to gain a general understanding of the study design, objectives, and relevance to my PICO question. I focused on systematic reviews, meta-analyses, and randomized controlled trials because they represent the highest levels of evidence. Additionally, I made sure that the studies compared the interventions of interest in my PICO. From there, I selected two articles: a systematic review evaluating the transition from conventional complete dentures to overdentures and a randomized controlled trial examining outcomes after overdenture treatment. I repeated a similar search process in EBSCO, which results in 4 articles. After reviewing the results, I identified one article that was a duplicate of a PubMed. The remaining articles were excluded because they were either lower levels of evidence or did not directly address my PICO question. Finally, I searched Google Scholar which gave me 210 articles after the initial search. I reviewed the first 20 articles after sorting by relevance. In the end, I chose two systematic reviews, one evaluating nutritional outcomes and the other assessing patient satisfaction and quality of life as primary outcomes.

Results found:

Article 1

Citation:

Kutkut, A., Bertoli, E., Frazer, R., Pinto-Sinai, G., Fuentealba Hidalgo, R., & Studts, J. (2018). A systematic review of studies comparing conventional complete denture and implant retained overdenture. *Journal of prosthodontic research*, *62*(1), 1–9. https://doi.org/10.1016/j.jpor.2017.06.004

Type of article: Systematic review

Abstract:

Purpose: Several studies have reported better outcomes when restoring the edentulous mandible with unsplinted implant-retained overdentures (IODs) compared to conventional complete dentures (CCDs). However, it is unclear if these benefits hold true when analyzing the full scope of literature. This systematic review aims to compare CCDs and unsplinted IODs regarding efficacy, patient satisfaction, and quality of life.

Study Selection: The primary question addressed was: How do CCDs compare to unsplinted IODs regarding efficacy, satisfaction, and quality of life? Researchers electronically searched three databases to find relevant articles comparing the two treatments. Out of twenty-six articles selected and reviewed in full: Twenty-five articles compared a maxillary CCD opposing a mandibular IOD retained by two unsplinted implants to CCDs restoring function in both arches. One article compared a maxillary CCD to a maxillary IOD.

Results: Outcome measures varied across studies and included the Oral Health Impact Profile (OHIP), visual analogue scales (VAS), and masticatory performance tests. Overall, IODs were associated with significantly better patient masticatory performance and Oral Health-Related Quality of Life (OHRQoL). Specifically, mandibular unsplinted IODs were more likely to improve OHRQoL for edentulous patients and yielded significantly higher ratings for overall satisfaction, comfort, stability, and the ability to speak and chew.

Conclusions: This systematic review concludes that IODs retained by two unsplinted mandibular implants are superior to conventional complete dentures (CCDs) in terms of efficacy, patient satisfaction, and quality of life.

Key findings:

- Implant-retained overdentures were associated with better masticatory performance compared with conventional complete dentures. Studies show that patients with conventional dentures reported more difficulty in biting (66.9%) and chewing food (75.7%) than patients with implanted dentures (33.3% and 24.3, respectively).
- Implant-retained overdentures were associated with higher overall patient satisfaction from both patient and prosthodontists.
- Patients with implant-retained overdentures reported improved oral health related quality of life. Patients reported better comfort, stability, ability to speak, and ability to chew with implanted dentures
- Implanted dentures provided significant improvement in unease in daily/social activities such as eating, speaking, yawning, kissing.
- Patients with implanted dentures were able to eat a wider variety of food items with less difficulty than those with conventional dentures
- Studies showed that implanted dentures showed significantly lower rating of psychological disability, discomfort, and limitation compared to conventional dentures. Psychologic discomfort includes worrying, feeling upset, embarrassment, and self-consciousness.
- Patients with implanted dentures were more likely to take in their nutrients through fresh whole fruits and vegetables. However, there were no clinically significant and consistent evidence that implanted dentures had an advantage on nutritional status over conventional dentures.

Why I chose this article: I chose this article because it directly addresses two major parts of my PICO question: chewing function and quality of life. Since it is a systematic review, it the highest level of evidence that provides a broader overview of multiple studies rather than relying on a single patient population. The article found that implant-retained overdentures were generally associated with better masticatory performance, improved denture stability, greater patient satisfaction, and better oral-health-related quality of life. These outcomes are directly relevant to my patient population because edentulous adults often struggle with poor denture fit, reduced chewing ability, and dissatisfaction with conventional dentures. For my PICO, this article is most useful for evaluating chewing ability, denture stability, comfort, satisfaction, and quality of life. However, I would not use this article as my strongest source for nutritional status because the

findings were less consistent and significant. Instead, I would use it as a foundational article showing that implant-retained overdentures improve the functional and patient-centered outcomes that may indirectly affect diet and nutrition.

Article 2

Citation:

Boven, G. C., Speksnijder, C. M., Meijer, H. J. A., Vissink, A., & Raghoebar, G. M. (2019). Masticatory ability improves after maxillary implant overdenture treatment: A randomized controlled trial with 1-year follow-up. *Clinical implant dentistry and related research*, *21*(2), 369–376. https://doi.org/10.1111/cid.12721

Type of article: Randomized Controlled Trial

Abstract:

Background: The effect of maxillary implant overdentures on masticatory ability in edentulous patients with complaints regarding their conventional maxillary dentures is unknown.

Purpose: To assess the change in objective masticatory ability, measured by the mixing ability index (MAI), patient-reported masticatory ability using a questionnaire, and patient satisfaction using the general satisfaction score (GSS) after maxillary implant overdenture treatment with either solitary attachments or bars.

Materials and Methods: Two groups randomly received four-implant maxillary overdentures on either solitary attachments (Group I, n = 25) or bars (Group II, n = 25). The MAI, questionnaire, and GSS were scored before treatment (T0) and 12 months after treatment (T12).

Results: After treatment, both groups had significantly better MAI outcomes, improved questionnaire scores, and higher GSS. Post-treatment questionnaire scores and GSS were significantly better for Group II. Before treatment, a strong positive correlation between the MAI and the questionnaire was found for all participants who had full conventional dentures combined (Group I, n = 17; Group II, n = 3).

Conclusion: Mixing ability was the same for all participants treated with maxillary implant overdentures on either solitary attachments or bars. Patient-reported masticatory ability and satisfaction were better for participants treated with maxillary implant overdentures on bars. There was a correlation between MAI and patient-reported masticatory ability in participants with full conventional dentures.

Keywords: dentures, humans, mastication, overdentures, prospective studies, quality of life.

Key findings:

- The study supports that implant over dentures can improve chewing function in patients dissatisfied with conventional dentures

- Implanted overdenture groups showed significant improved masticatory ability after treatment
- General patient satisfaction improved after implant overdenture treatment with a median satisfaction score of 8 and 9 on a 10 point-scale.
- Patients treated with maxillary implant overdentures supported by bars reported higher satisfaction and chewing ability compared to those with solitary attachments. Ability of chew hard foods improved more in the bar supported implants compared to that of the solitary supported implants

Why I chose this article: I chose this article because it is a randomized controlled trial with a 1 year follow up on patients who received implanted dentures. Unlike a systematic review, this study directly followed patients before and after implant overdenture treatment and measured changes in chewing function and satisfaction. This is important for my PICO because the study does not only report patient opinions but also uses an objective masticatory test to evaluate chewing ability. This makes the findings more clinically useful because it shows that improvement was not only based on how patients felt, but also on measurable changes in mastication. This article is especially relevant because the patients in the study had complaints about their conventional dentures, which is similar to the type of patient who may be considering implant-supported dentures in real clinical practice. I chose this article to strengthen the chewing function portion of my PICO because it shows that implant overdenture treatment can improve both objective chewing performance and patient-reported satisfaction. It also adds variety to my PICO because it is a randomized controlled trial rather than another systematic review.

Foreign study considerations:
Cultural/social context: This study was conducted in the Netherlands where patient expectations about dental care, prosthetic treatment and satisfaction may differed from those in the United States. Not to mention, dietary habits in the Netherlands may differ from those in the states. Since chewing function can influence the ability to eat harder food and patient satisfaction level, the differences in diet may influence how much patients notice or report functional improvement,

Economic context: Access to implanted dentures may differ in the Netherlands and the United States due to differences in healthcare systems, dental coverage and out of pocket costs. The Netherlands have a universal healthcare system whereas the United States have a mix public-private healthcare system.

Language: The study included patient-reported questionnaires. The most widely used language in the Netherlands is Dutch with English being the most common second language. Language translation may affect how patients interpreted questions about satisfaction and chewing ability. Even so, the study used an objective mixing ability test that measures physical ability to break down food and is less dependent on language or patient perception.

Article 3
Citation:

Lin, G. H., Chen, Z., Goodacre, B. J., & Curtis, D. A. (2026). Transitioning From Conventional Dentures to Implant-Retained Overdentures in the Edentulous Maxilla: A Systematic Review on Patient-Reported and Clinician-Reported Outcomes. *Clinical oral implants research*, *37 Suppl 30*(Suppl 30), S204–S219. https://doi.org/10.1111/clr.14446

Type of article: Systematic review

Abstract:
Background: This study aims to examine commonly used patient-reported outcomes (PROs) and patient-reported outcome measures (PROMs), alongside clinician-reported outcomes (ClinROs), in individuals with an edentulous maxilla who were initially rehabilitated with conventional complete dentures (CDs) and later transitioned to implant-retained overdentures (IODs).

Material and Methods: An electronic search of three databases and a manual search were conducted for relevant articles published between January 2014 and June 2024. Eligible studies included patients with an edentulous maxilla or those scheduled for extraction of all maxillary teeth who were treated with conventional complete dentures and subsequently transitioned to implant-retained overdentures. The studies also had to report patient-reported outcomes and clinician-reported outcomes.

Results: Nine articles, including five randomized controlled trials and four prospective cohort studies, were selected for descriptive analysis. Five studies reported clinician-reported outcomes, focusing on implant survival rates, peri-implant marginal bone loss, and the presence of peri-implant diseases such as peri-implant mucositis and peri-implantitis. Patient-reported outcomes varied across studies and included assessments of oral health-related quality of life, patient satisfaction, comfort, stability, ability to chew, speech, and esthetics. Overall, implant-retained overdentures significantly improved patient satisfaction and oral health-related quality of life compared to conventional complete dentures.

Conclusion: For patients initially rehabilitated with conventional complete dentures and later transitioned to implant-retained overdentures, oral health-related quality of life was the most frequently reported patient-reported outcome, followed by patient satisfaction. Regarding clinician-reported outcomes, implant survival rate was the most commonly investigated outcome, followed by peri-implant marginal bone loss, denture survival rate, and prosthetic complications. Implant complications and the presence of peri-implant diseases were also commonly documented.

Key findings:

- Implanted dentures were associated with significant improvement in oral-health related quality of life compared to conventional dentures
- Patient satisfactions were higher after transitioning to implanted dentures. Patient reported benefits of implanted dentures included: comfort, stability, ability to chew, speech, aesthetics and cleaning ability.

- One cohort study reported implant survival rates of 86.3% at 6 months, 84.0% at 1 year, 82.3% at 2 years and 78.4% at 3 years. But survival rate is heavily influenced by the type of implants and attachment used. Overall, survival rate of implanted dentures was generally high (~96.7% - 99.2%) in the other studies.
- Complications of implanted dentures included prosthetic repairs, attachment changes, need for clip-tightening, nylon cap replacement, implantitis
    - In one study, implantitis occurred in 17.2% or patients with 4 implanted overdentues and 9.7% in patients with 6.

Why I chose this article: I chose this article because it provides a balanced view by including both patient-reported and clinician-reported outcomes. While the review showed that implant-retained overdentures generally improved quality of life, satisfaction, chewing ability, and etc, it also showed that implants are not without complications. Reported issues included prosthetic repairs, attachment changes, peri-implant mucositis, peri-implantitis, and other maintenance needs. This makes the article helpful for my PICO because it supports the benefits of implant-retained overdentures while also reminding clinicians to consider long-term maintenance, complications, cost, and patient selection for these types of interventions.

Article 4

Citation:

Batista, D. S., Manfron, G. A. W., Bubna, D. P., Barbosa, D. M., Stechman-Neto, J., Taveira, K. V. M., de Araujo, C. M., Gonçalves, F. M., & Bronholo, T. P. M. (2026). Nutritional Outcomes of Overdentures vs. Complete Dentures in Older Edentulous Adults: A Systematic Review and Meta-Analysis. *Journal of oral rehabilitation*, *53*(2), 592–602. https://doi.org/10.1111/joor.70111

Type of article: Systematic review and meta-analysis

Abstract:

Objective: To investigate whether implant-supported overdentures provide nutritional advantages compared with conventional complete dentures in older edentulous adults through a systematic review and meta-analysis.

Methods: A comprehensive search was performed in PubMed/MEDLINE, Scopus, Web of Science, Cochrane Library, EMBASE, LILACS, LIVIVO, and grey literature sources. Eligible studies included completely edentulous patients aged 60 years or older who were rehabilitated with overdentures or conventional complete dentures, with nutritional intake assessed using validated methods. Data extraction and risk-of-bias assessments were conducted independently by calibrated reviewers. Random-effects meta-analyses were performed, and the certainty of evidence was rated using GRADE.

Results: Nine studies met the inclusion criteria, of which five were included in the quantitative synthesis. Overdenture users showed significantly higher vitamin B12 levels at 6-month follow-up (SMD = 0.60; 95% CI: 0.18–1.02; I^2 = 54%), but no consistent differences were observed for albumin or folate. Overall certainty of the evidence was rated as moderate for vitamin B12 and

albumin, and low for folate due to methodological limitations, heterogeneity in outcome measures, and small sample sizes.

Conclusion: While overdentures improve masticatory function and may transiently enhance vitamin B12 status, the current body of evidence does not support a consistent nutritional advantage over conventional dentures. High-quality, long-term trials are needed to clarify the systemic nutritional implications of prosthetic rehabilitation in older adults.

Key findings:

- Overdenture patients had significantly higher vitamin B12 levels at 6 months follow up visit. No significant comparison in folate or albumin levels
- Some studies found reported better nutritional studies and lower malnutrition risk in overdenture users because they may be able to eat harder and more fibrous foods due to improved mastication.
- Many patients were reported to have continue the same dietary habits even after prosthetic rehabilitation
- Possible reasons for limited nutritional improvements included: long standing food preferences, psychological barriers, limited nutritional literacy, socioeconomic factors, lack of structed dietary counseling
- Overall, implanted dentures may improve chew ability and improve vitamin B12 status temporarily, but there is still need for further research to prove consistent nutritional advantages

Why I chose this article: I chose this article because it directly addresses the nutritional status part of my PICO question, which was not as strongly answered by the other articles. While the other studies mainly show that implant overdentures can improve chewing function, comfort, patient satisfaction, and quality of life, this article focuses on whether those improvements lead to better nutritional status. This is important because one assumption is that if a patient can chew better, they will automatically eat better However, this review shows that the relationship is not that simple. The findings were useful because overdenture users had significantly higher vitamin B12 levels at 6-month follow-up, yet there were no consistent improvements in albumin or folate. This suggests that implant overdentures may provide some nutritional benefit, but the evidence does not clearly support a consistent overall nutritional advantage compared with conventional dentures. Implant overdentures may improve chewing and quality of life, but nutritional improvement may also depend on other factors such as dietary habits, access to food, socioeconomic status, patient education, and nutritional counseling.

Clinical bottom line:

Based on all the evidence gathered, implant overdentures appear to improve chewing function, denture stability, patient satisfaction, and oral-health-related quality of life compared to conventional dentures. For a patient whose main issue is poor denture retention and reduced

chewing ability, overdentures may provide improvement in daily function and quality of life. However, the evidence for nutritional improvement is less consistent. Although overdentures may help patients chew harder or more fibrous foods as well as temporarily improve vitamin B12 levels, studies do not show consistent improvements in albumin, folate, or overall nutritional status. Therefore, overdentures should not be seen or presented as a guaranteed way to improve nutrition. Instead, nutritional improvement will require additional dietary counseling, patient education, and follow-up with primary care providers or orthodontists.

In underserved populations, this recommendation must be individualized since implant overdentures may be difficult to access due to cost, dental coverage, specialty care, follow-up visits, and long-term maintenance. Health literacy, transportation, access to food, food preferences and the patient's ability to maintain oral hygiene may also affect success of overdentures. Therefore, overdentures are a reasonable option to discuss for this patient, but there should be a discussion of expected benefits, complications, cost, maintenance needs, and a structured nutrition counseling.