



ISSN Print: 2394-7489  
ISSN Online: 2394-7497  
IJADS 2023; 9(4): 149-153  
© 2023 IJADS  
[www.oraljournal.com](http://www.oraljournal.com)  
Received: 13-08-2023  
Accepted: 15-09-2023

**Laura Elisa Cerón Flores**  
Master's Degree in  
Prosthodontics, Universidad  
Autónoma de Nuevo León,  
Facultad de Odontología,  
Monterrey, Nuevo León, México

**María Fernanda Sepúlveda Leos**  
Master's Degree in  
Prosthodontics, Universidad  
Autónoma de Nuevo León,  
Facultad de Odontología,  
Monterrey, Nuevo León, México

**Norma Cruz**  
Master's Degree in  
Prosthodontics, Universidad  
Autónoma de Nuevo León,  
Facultad de Odontología,  
Monterrey, Nuevo León, México

**Patricia García Palencia**  
Department of Microbiology,  
Universidad Autónoma de  
Nuevo León, Facultad de  
Odontología, Monterrey, Nuevo  
León, México

**Corresponding Author:**  
**Laura Elisa Cerón Flores**  
Master's Degree in  
Prosthodontics, Universidad  
Autónoma de Nuevo León,  
Facultad de Odontología,  
Monterrey, Nuevo León, México

## All on four: A systematic review

**Laura Elisa Cerón Flores, María Fernanda Sepúlveda Leos, Norma Cruz and Patricia García Palencia**

DOI: <https://doi.org/10.22271/oral.2023.v9.i4c.1864>

### Abstract

**Introduction:** The need to rehabilitate fully edentulous patients is expected to increase significantly globally in the future.

**Objective:** To carry out a review of the literature published in high-impact journals about the "All on four" technique, the most common complications when performing this technique, the difference between analog and digital flow, the materials from which implant-supported prostheses can be made and the postoperative satisfaction of patients.

**Methodology:** A search was conducted in the Pubmed, EBSCO and Google Scholar databases. The terms "All on four", "Fixed prostheses", "Removable prostheses" and "implant-supported full dentures" were used in an advanced search.

**Results: Complications** can be divided into early and late, prosthetically the ones that we can avoid with good planning are the late ones. Patient satisfaction is usually high with implant-supported prostheses, although a structured maintenance program must be in place for the long-term success of the implants. The digital flow streamlines the protocol and presents a wide variety of materials for rehabilitation.

**Conclusions:** The digital flow represents a valid treatment alternative for the rehabilitation of edentulous arches with implant-supported prosthesis, the risks and complications must be considered prior to case planning to obtain a better treatment result and patient satisfaction. There are many material options for prostheses, both metal, ceramic and materials for milling in the digital flow; the choice of material will depend on the case and the oral conditions of the patient.

**Keywords:** All on four", "fixed prosthesis", "removable prosthesis" "total implant-supported prosthesis

### 1. Introduction

It is expected that the need to rehabilitate fully edentulous patients will increase significantly globally in the future <sup>[1]</sup>.

Edentulism is a global phenomenon that is described as the complete loss of dental organs, it is a common disability within the elderly population <sup>[2]</sup>. Because life expectancy has increased globally, an overall increase in population aging is expected, so the edentulous population will increase accordingly <sup>[3]</sup>.

The "All-On-Four" treatment concept was developed to maximize the use of bone available in atrophic jaws. To overcome biological and biomechanical complications, such as the presence of inferior alveolar nerve in the lower arch, important blood vessels, maxillary and paranasal sinuses, and decrease the distal cantilever system. Thus allowing immediate function (immediate loading) and bone regeneration procedures <sup>[4]</sup>.

The principle of this treatment option is to use four implants in the anterior part of edentulous jaws to support a prosthesis that is either fixed or removable, and depending on the initial torque of the implants the possibility of immediate loading. The two most anterior implants are placed axially, while the two posterior implants are placed at a distal angle to minimize the length of the cantilever – this allows the prosthesis to span the length of approximately 12 teeth <sup>[5]</sup>.

There are some literature reviews on the subject, mainly on the risks and complications, and now with the introduction of more advances in dental technology also about digital and hybrid flows. Although there is no one where complications are evaluated, a comparison between analog and digital flow, prosthetic materials and patient postoperative satisfaction is evaluated.

To carry out a review of the literature published in high-impact journals about the "All on four" technique, the most common complications when performing this technique, the difference between analog and digital flow, the materials from which implant-supported prostheses can be made, and the postoperative satisfaction of patients.

## 2. Methodology

We searched in Pubmed, EBSCO and Google Scholar databases. Terms as "All on four", "Fixed prostheses", "Removable prostheses" and "implant-supported full dentures" were used in an advanced search.

## 3. Results

### 3.1 Analog Digital V.S Protocol

In recent years, the increase in technological advances has made it possible to improve the way of diagnosing, planning and executing treatments, especially in surgical treatments such as the placement of implants and their rehabilitation<sup>[6]</sup>. Software for dental technicians and clinicians has been introduced to the market that helps to better communicate between both parties; therefore, it is possible to develop an implant prosthetic rehabilitation, even in the most complex scenarios, through the use of software, thus having the opportunity to preview the final result and, consequently, improve communication between the clinician and the patient, and between the prosthodontist, the surgeon and the dental technician, also achieving a better quality of treatment and the result<sup>[7]</sup>.

#### 3.1.1 Analog flow

Regardless of the flow with which the treatment is to be carried out, in the first appointment there must be an exhaustive compilation of the patient's medical history, make a diagnosis, in case the patient has remaining pieces with a poor or reserved prognosis, it is necessary to extract the pieces and leave the patient with a transitory prosthesis prior to planning the placement of implants<sup>[8]</sup>.

When carrying out a conventional protocol, study models of the patient must be taken, a well-fitting prosthesis must be made as a radiographic guide, and the patient must be sent for a CBCT, followed by the planning of implant placement. The transitional prosthesis can be used as a non-restrictive surgical guide and the two most mesial implants are placed with an axial angulation and the two most distal implants are placed at an angle of approximately 30°-35°. Subsequently, the provisional abutments are placed to load the implants with an immediate prosthesis, to place it, the mucosa is isolated with a dam rubber and the prosthesis is relined with pink resin, once cured, it is polished and screwed to the implants<sup>[9]</sup>.

The success of All on Four implant treatment depends on achieving a passive fit between the implant structures and the underlying structures. To achieve a passive fit, it is important to make an accurate impression. This is affected by factors such as the impression material, the impression tray, the printing technique, and the material with which the print posts are splinted<sup>[10]</sup>.

#### 3.1.2 Digital flow

Once the initial data has been collected, a series of intraoral and extraoral photographs should be taken with rollers marked in the anterior area, the canine lines, midline and the smile line; this to align the photographs taken with the STL files of the study model scan and the transitional prosthesis, in a CAD software. Subsequently, a prosthesis is milled in

PMMA; A mock-up test is performed on the patient where the aesthetics and function of the prosthesis are observed, and the details are adjusted. Once ready, markings are added where the implants are planned to be placed and the patient is sent for a radiological CT scan examination<sup>[11]</sup>.

Some software is used where the STL can be matched with the DICOM of the tomography and thus plan the position of the implants. The implant plan is sent to laboratory fabricating a restrictive surgical guide<sup>[12]</sup>.

The surgical intervention is usually performed without lifting the flap, the implants must have an initial torque of 35-55 N to load them with an immediate prosthesis.

Many authors demonstrate the accuracy and predictability of intraoral scanning for complete arch rehabilitation with implants. Digital prints are a viable alternative to the analogue technique<sup>[6]</sup>.

The main disadvantages of guided (digital) surgery are insufficient irrigation, inability to visualize the surgical site, increased risk of error in the position of implants with great atrophy of the jawbone, and discrepancy between the virtual plan and the current position of the implant<sup>[13]</sup>.

**Conclusion:** Digital flow represents a valid treatment alternative for the rehabilitation of edentulous arches with implant-supported prosthesis, there are certain risks, but the accuracy of implant placement and the apparent success in the medium term are shown to be like conventional flow. The digitally guided approach facilitates the clinician's maneuver during surgery and the prosthetic process, decreases the time spent in the dental chair and shows favorable results; But it requires a steeper learning curve to do so. Some studies agreed that long-term clinical trials are required to evaluate the difference between the two flows for more than five years.

### 3.2 Prosthetic Materials

Prosthetic materials commonly used in All on Four prostheses are a major factor affecting the stress/strain seen in implants and peri-implant bone. Stress is higher in prosthetic materials with high hardness and durability. However, if the material has a high modulus of elasticity, fracture or mechanical complications versus bending and deformations are lower<sup>[14]</sup>. In this regard, while some researchers suggest a metal substructure due to its rigid structure, others suggest all-acrylic resin prostheses and claim that this structure has the possibility of being used for a longer period<sup>[15]</sup>.

Initially, prostheses on implants were made on a cast metal structure and later, thanks to technological advances, they were made on milled bars. Recently, however, polymeric materials have gained attention, especially those classified as ultra-high-performance, such as polyetheretherketone acetone (PEKK) and polyetheretherketone (PEEK) which are part of a family of ultra-high-performance thermoplastic polymers called polyaryletherketones (PAEKs)<sup>[16]</sup>.

These semi-crystalline polymers are characterized by their excellent mechanical performance, their application has been investigated in several designs of dental prostheses and supported by implants. PEKK is at the top of the PAEK family, and its compressive strength is approximately 80% higher than that of PEEK<sup>[17]</sup>.

Another study observed the stress concentrated on the prosthesis on implants, the supporting structure and the bone tissue surrounding the implants; in this study it was observed that when force was applied to the prosthesis, the prosthetic structure of monolithic zirconia produced intense stresses, but considerably decreased the stresses transmitted to the

implants and to the bone [18].

In 2021, a study was carried out evaluating the distribution of occlusal forces in the bone and implants, according to the material of the prosthetic base and the length of the cantilever layer, the results of the study indicated that regardless of the material used, the increase in the length of the cantilever and occlusal forces increased the tension around the implants. In the same study, when forces were applied to the structure with a zero mm cantilever layer, the lowest peri-implant stress was observed in PEEK, while zirconia showed the highest peri-implant stress values. In contrast, when forces were applied to the 15 mm and 25 mm cantilever structure, the least peri-implant deformation was observed in zirconia, while PEEK showed the highest strain values, and the difference was statistically significant between all groups [19].

It was observed in one study that the elastic performance of the PEEK structure combined with PMMA veneers can reduce occlusal forces, thus protecting the implant-supported restoration and antagonist dentition, especially in All on four treatments, where there is a lack of proprioception and a wide distance between implants [20].

**Conclusion:** Nowadays there is a wide variety of dental materials for use in prostheses on implants, such as different metal alloys, acrylics, etc. The choice of the ideal material will depend on the case, if you have a cantilever you will opt for a material with a greater resistance that distributes less force to the implant as some authors concluded: zirconia; On the other hand, if the patient has bruxism, a more resilient material such as a polyaryletherketone should be chosen.

### 3.3 The main complications

Complications of implants or prostheses-on-implants can be classified into early failure and late failure based on the timing of the abutment attached: early failures occurred prior to the application of functional loading, and late failures occurred after the application of occlusal loading or the first removal of the provisional restoration in cases of immediate loading [21]. Common risk factors related to late dental implant failure could be classified into three groups that include patient history (radiation therapy, bruxism, periodontitis, and early implant loss), clinical parameters (type 4 bone and implant placed at a later location), and decisions made by the physician (low initial stability, more than one implant placed during surgery, or using an implant-supported overdenture with type connection cone) [22].

Extensive tooth loss leading to edentulous status is frequently associated with several risk factors, including poor oral hygiene, smoking, low socioeconomic status, and high susceptibility to severe periodontitis. These conditions also increase the risk of biological complications from implants. For most people, poor oral health has an impact on their overall quality of life, so this variable is an important aspect when assessing the outcome of this type of prosthetic rehabilitation [24].

Multiple studies have shown higher rates of technical complications in terms of chipping and wear of the prosthesis material; a systematic review found that fracture of the porcelain veneer over the prosthesis was the most common technical complication in studies with a follow-up of at least 5 years [25]. A randomized clinical trial found that the most common minor biological complication was soft tissue recession with an approximate 5-year rate of 45.5%, while the most common major complication was peri-implantitis with an estimated implant-based rate of 9.5%. The most frequent

minor technical complication was wear of the prosthetic material with an estimated rate of 49.0%, while the most frequent major technical complication was fracture of the prosthetic material with an estimated rate of 8.0% [26].

Technical complications following the placement of the definitive prosthesis can result in a higher number of repairs and maintenance sessions, as the 10-year cumulative rate of "complication-free prosthesis" was 8.6% in a 2019 study [27].

In a study where 747 zygomatic implants were placed, they described that there were mechanical complications in 156 patients (44%), of which 101 suffered prosthetic fractures at follow-ups of 6 months to 7 years. Likewise, in another study, they reported a higher number of prosthetic fractures in patients rehabilitated with conventional implants (n = 6) than in patients with zygomatic implants (n = 1), with a statistically significant difference [28].

**Conclusion:** If, prior to implant planning, we identify the risk factors related to late failure of dental implants, this could help predict treatment outcomes and make the necessary modifications in the treatment plan; It also helps prevent conflicts not only in the relationship between the doctor and the patient, but also between the different specialists and the dental technician. Most of the authors concluded that it is more common for a mechanical complication to occur than a biological one, such as a fracture of the porcelain on the prosthesis, wear of the material or even fracture of the prosthesis.

### 3.4 Postoperative satisfaction

The main objective of these surgical techniques, bone regeneration or the placement of angled implants, is to restore chewing function, aesthetics, comfort and improve the self-esteem and social ease of patients; so, it is important to assess their satisfaction and comfort with their prostheses [28].

Implant-supported fixed prostheses meet all of these goals, so it is expected to lead to higher levels of patient satisfaction with treatment, as well as higher success rates.

For most people, poor oral health has an impact on their quality of life, so this variable is an important aspect to evaluate in the outcome of implant-supported prosthetic rehabilitation. The most common and reliable tool for assessing the impact of oral health on quality of life is The Oral Health Impact Profile (OHIP-14), a 14-question questionnaire designed to assess the impact of oral health on quality of life [24].

In a prospective randomized clinical study, the patient's quality of life and satisfaction were observed in two groups with two different implant technique approaches, one with zygomatic and axial implants, the second with conventional implants, two angled and two axial, according to the All on four protocol. In this study, the opinion of 80 patients with a one-year follow-up was evaluated; No significant difference was observed between patient satisfaction in the two groups [29].

In addition, another study evaluated patients' oral quality of life before, during, and after completion of implant-supported full-arch immediate loading rehabilitation, also using OHIP-14. Patients reported an improvement in oral quality of life after rehabilitation and a significant improvement in aesthetic and chewing ability was found. At four months, 92% of patients did not feel tense when smiling, 96% did not show problems relating to other people or smiling, and 92% showed no difficulty eating certain foods. In addition, patients with zygomatic implants were more satisfied with their prostheses

than patients rehabilitated with All on four, also with a statistically significant difference.<sup>30</sup> The fixed prosthesis supported by implants reports producing a high quality of life (QoL) and patient satisfaction with respect to its retention in the jaws, stability and ease of chewing, according to some authors.<sup>31</sup> Despite the high levels of satisfaction of patients with implant prostheses, those patients who do not participate in a support program for motivation in their oral hygiene will show high rates of biological complications; for this reason, patients must be strongly motivated, at the time of delivery of the prosthesis, to actively participate in a structured maintenance program<sup>[23]</sup>.

**Conclusion:** According to most of the authors, prostheses on implants produce high patient satisfaction, regardless of whether they are fixed or removable, although it is important to strengthen hygiene habits in elderly patients or patients with poor dental hygiene for the success of treatment in the long term, otherwise there is a high risk of peri-implantitis and early loss of implants.

#### 4. Conclusions

The digital flow represents a valid treatment alternative for the rehabilitation of edentulous arches with implant-supported prosthesis, the risks and complications must be considered prior to the planning of the case to obtain a better treatment result and patient satisfaction. There are many material options for prostheses, both metal, ceramic and materials for milling in the digital flow; the choice of material will depend on the case and the oral conditions of the patient.

#### 5. Conflict of Interest

Not available

#### 6. Financial Support

Not available

#### 7. References

- Afrashtehfar KI, Moawad RA, F-Eddin AW, Wang HL. Mandibular full-arch fixed prostheses supported by three-dental-implants: A protocol of an overview of reviews. *PLoS One*. 2022 Apr 4;17(4):e0265491.
- Lee DJ, Saponaro PC. Management of Edentulous Patients. *Dent Clin North Am*. 2019;63(2):249–61.
- Roberto LL, Crespo TS, Monteiro-Junior RS, Martins A, De Paula AMB, Ferreira EF, *et al*. Sociodemographic determinants of edentulism in the elderly population: A systematic review and meta-analysis. *Gerodontology*. 2019;36(4):325–37.
- Malo P, Rangert B, Nobre M. All-on-Four immediate function concept with Brånemark system implants for completely edentulous mandibles: A retrospective clinical study. *Clin. Implant Dent. Res*. 2003;5(Suppl. 1):2–9.
- Patzelt SB, Bahat O, Reynolds MA, Strub JR. The all-on-four treatment concept: A systematic review. *Clin Implant Dent Relat Res*. 2014 Dec;16(6):836–55.
- Cappare P, Teté G, Romanos GE, Nagni M, Sannino G, Gherlone EF. The 'All-on-four' protocol in HIV-positive patients: A prospective, longitudinal 7-year clinical study. *Int. J Oral Implantol*. 2019;12:501–510.
- Gastaldi G, Gherlone E, Manacorda M, Ferrini F, Bova F, Vinci R, *et al*. A 3-D CAD/CAM technique in full-arch implant supported rehabilitations: The Virtual Implant-Prosthetic Procedure (VIPP Technique). A prospective longitudinal study. *J Osseointegr*. 2018;10(1):2–10.
- de Luna Gomes JM, Lemos CAA, Santiago Junior JF, de Moraes SLD, Goiato MC, Pellizzer EP, *et al*. Optimal number of implants for complete-arch implant-supported prostheses with a follow-up of at least 5 years: A systematic review and meta-analysis. *J Prosthet. Dent*. 2019;121(5):766–74 e3.
- Cattoni F, Chirico L, Merlone A, Manacorda M, Vinci R, Gherlone EF. Digital Smile Designed Computer-Aided Surgery versus Traditional Workflow in "All on Four" Rehabilitations: A Randomized Clinical Trial with 4-Years Follow-Up. *Int. J Environ. Res. Public. Health*. 2021 Mar 26;18(7):3449.
- Shankar SD, Doddamani S. To evaluate and compare the accuracy of definitive casts using various splinting methods on implant level impressions in All-on-Four treatment: An *in vitro* study. *J Indian Prosthodont. Soc*. 2020 Apr-Jun; 20(2):193–201.
- Yang JW, Liu Q, Yue ZG, Hou JX, Afrashtehfar KI. Digital Workflow for Full-Arch Immediate Implant Placement Using a Stackable Surgical Guide Fabricated Using SLM Technology. *J Prosthodont*; c2021.
- Cappare P, Sannino G, Minoli M, Montemezzi P, Ferrini F. Conventional versus Digital Impressions for Full Arch Screw-Retained Maxillary Rehabilitations: A Randomized Clinical Trial. *Int. J Environ. Res. Public Health*. 2019;16:829.
- Vinci R, Manacorda M, Abundo R, Lucchina A, Scarano A, Crocetta C, *et al*. Accuracy of Edentulous Computer-Aided Implant Surgery as Compared to Virtual Planning: A Retrospective Multicenter Study. *J Clin. Med*. 2020;9:774.
- Durkan R, Oyar P, Deste G. Maxillary and mandibular all-on-four implant designs: A review. *Niger. J Clin. Pract*. 2019 Aug; 22(8):1033–1040.
- Ayna M, Gülses A, Acil Y. A comparative study on 7-year results of All-on-Four TM immediate-function concept for completely edentulous mandibles: Metal-ceramic vs. bar-retained superstructures. *Odontology*. 2018;106:73–82.
- Dawson JH, Hyde B, Hurst M, Harris BT, Lin WS. Polyetherketoneketone (PEKK), a framework material for completefixed and removable dental prostheses: A clinical report. *J Prosthet Dent*. 2018;119(06):867–872.
- Amelya A, Kim JE, Woo CW, Otgonbold J, Lee KW. Load-bearing capacity of posterior CAD/CAM implant-supported fixedpartial dentures fabricated with different esthetic materials. *Int J Prosthodont*. 2019;32(02):201–204.
- Deste G, Durkan R. Effects of all-on-four implant designs in mandible on implants and the surrounding bone: A 3-D finite element analysis. *Niger J Clin. Pract*. 2020 Apr;23(4):456–463. Doi: 10.4103/njcp.njcp\_471\_19. PMID: 32246650.
- Schwarz F, Schar A, Nelson K, Fretwurst T, Flugge T, Ramanauskaitė A, *et al*. Recommendations for Implant-Supported Full-Arch Rehabilitations in Edentulous Patients: The Oral Reconstruction Foundation Consensus Report. *Int J Prosthodont*. 2021;34(Suppl):s8–s20.
- Zoidis P. The all-on-4 modified polyetheretherketone treatment approach: A clinical report. *J Prosthet Dent*. 2018;119(4):516–521.
- Sakka S., Baroudi K., Nassani M.Z. Factors associated with early and late failure of dental implants. *J. Investig*.



- Clin. Dent. 2012;3(4):258–261.
22. Do TA, Le HS, Shen YW, Huang HL, Fuh LJ. Risk Factors related to Late Failure of Dental Implant—A Systematic Review of Recent Studies. *Int. J. Environ. Res. Public Health*. 2020 Jun;17(11):3931.
  23. Romanidi M, Cordaro M, Donno S, Cordaro L. Discrepancy Between Patient Satisfaction and Biologic Complication Rate in Patients Rehabilitated with Overdentures and Not Participating in a Structured Maintenance Program After 7 to 12 Years of Loading. *Int. J. Oral Maxillofac. Implant*. 2019;4:1143–1151.
  24. Sánchez-Siles M, Ballester-Ferrandis JF, Salazar-Sánchez N, Gómez-García FJ, Moraleja-Ruiz R, Camacho-Alonso F. Long-term evaluation of quality of life and satisfaction between implant bar overdentures and conventional complete dentures: a 23 years retrospective study. *Clinical implant dentistry and related research*. 2018 Apr;20(2):208-214.
  25. Wong CKK, Narvekar U, Petridis H. Prosthodontic complications of metal-ceramic and all-ceramic, complete-arch fixed implant prostheses with minimum 5 years mean follow-up period. A systematic review and meta-analysis. *J Prosthodont* 2019;28(2):e722-e735.
  26. Papaspyridakos P, Bordin TB, Kim YJ, *et al*. Implant survival rates and biologic complications with implant fixed complete dental prostheses: A retrospective study with up to 12 years of follow-up. *Clin Oral Implants Res*. 2018;29(8):881-893.
  27. Papaspyridakos P, Bordin TB, Natto ZS, Kim YJ, El-Rafie K, Tsigarida A, *et al*. Double Full-Arch Fixed Implant-Supported Prostheses: Outcomes and Complications after a Mean Follow-Up of 5 Years. *J Prosthodont*. 2019 Apr; 28(4):387-397.
  28. Esposito M, Davó R, Marti-Pages C, Ferrer-Fuertes A, Barausse C, Pistilli R, *et al*. Immediately loaded zygomatic implants vs conventional dental implants in augmented atrophic maxillae: 4 months post-loading results from a multicentre randomised controlled trial. *Eur. J. Oral Implantol*. 2019;11(1):11–28.
  29. Fernández-Ruiz JA, Sánchez-Siles M, Guerrero-Sánchez Y, Pato-Mourello J, Camacho-Alonso F. Evaluation of Quality of Life and Satisfaction in Patients with Fixed Prostheses on Zygomatic Implants Compared with the All-on-Four Concept: A Prospective Randomized Clinical Study. *Int J Environ Res Public Health*. 2021 Mar 25;18(7):3426.
  30. Dellepiane E, Pera F, Zunino P, Mugno MG, Pesce P, Menini M. Patient satisfaction and comfort after a full-arch immediate loaded prosthesis. *J. Oral Implantol*. 2020;46:540–549.
  31. Tsigarida A, Chochlidakis K. A Comparison Between Fixed and Removable Mandibular Implant-Supported Full-Arch Prostheses: An Overview of Systematic Reviews. *Int J Prosthodont*. 2021;34:s85–s92.
  32. Hasanzade M, Shirani M, Afrashtehfar KI, Naseri P, Alikhasi M. *In vivo* and *in vitro* comparison of internal and marginal fit of digital and conventional impressions for full-coverage fixed restorations: A systematic review and meta-analysis. *J Evid Based Dent Pract*. 2019;19(3):236–54.
  33. Hasanzade M, Aminikhah M, Afrashtehfar KI, Alikhasi M. Marginal and internal adaptation of single crowns and fixed dental prostheses by using digital and conventional workflows: A systematic review and meta-analysis. *J Prosthet Dent*. 2021;126(3):360–368.
  34. Lee DJ, Saponaro PC. Management of Edentulous Patients. *Dent Clin North Am*. 2019;63(2):249–61.
  35. Pauletto P, Ruales-Carrera E, Goncalves T, Philippi AG, Donos N, Mezzomo LA. Fixed and Removable Full-Arch Restorations Supported by Short (</ = 8-mm) Dental Implants In the Mandible: A Systematic Review and Meta-Analysis. *Int J Oral Maxillofac Implants*. 2019;34(4):873–85.
  36. Sadowsky SJ. Comments regarding: De Luna Gomes *et al*. Optimal number of implants for complete arch implant supported prostheses with a follow-up of at least 5 years: A systematic review and metaanalysis. *J Prosthet. Dent* 2019; 121:766–74. *J Prosthet Dent*. 2021;125(2):375.

**How to Cite This Article**

Flores LEC, Leos MFS, Cruz N, Palencia PG. All on four: A systematic review. *International Journal of Applied Dental Sciences*. 2023;9(4):149-153.

**Creative Commons (CC) License**

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.