

Review Article

ASSESSMENT OF THE NEED TO USE FACEBOW IN CONVENTIONAL COMPLETE PROSTHESES – INTEGRATIVE REVIEW OF THE LITERATURE

ABSTRACT

Introduction: The use of the face bow (FB) has become a practice widely used by professionals seeking to transfer patient information to the semi-adjustable articulator (ASA). However, its use for the manufacture of conventional complete dentures (CD) has come to be questioned in research and dentistry schools.

Objective: To evaluate the need to use FB in the creation of CD compared to other conventional techniques, to determine the real need for its use, in relation to the precision and quality of rehabilitation with CD.

Methodology: The survey for this study was carried out in electronic databases (Medline, Cochrane, Scielo, and Scopus). Articles published in the last 15 years were included; Articles in Portuguese and/or English; Controlled and/or randomized clinical trials; Articles that compare CD made with and without the use of FB; Articles that evaluate the efficiency of the face bow in different prosthetic procedures. Articles that did not evaluate the need for the face bow or its effectiveness in the manufacture of prostheses were excluded; Duplicate studies. 6 articles were selected to form this study.

Results and Discussion: After evaluating the studies collected, they did not find significant differences with the use of the face bow, even in simplified methods for creating CD. Studies indicate that the use of FB is indifferent to the quality of the prosthesis manufactured. Furthermore, eliminating the face bow reduces treatment time and minimizes errors due to the reduction in the number of clinical steps.

Conclusions: The studies concluded that there are no significant differences between CD made with or without the use of FB, and that both provide satisfactory prostheses. However, more studies on the topic are needed to ensure greater safety for professionals in the field.

Keywords: Face Bow; Denture, Complete; Mouth Rehabilitation.

1. INTRODUCTION

Complete edentulism is one of the main public health issues in Brazil and the world. Patients with these oral conditions end up losing their chewing and aesthetic ability, causing difficulties in chewing, speaking and social disorders. Although the literature reports a decline in the

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"..has become an essential tool for...."

"FB plays a pivotal role in transferring...."

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prevalence of these cases in developed countries, there are still patients who require prosthetic treatment worldwide [1]. Complete dentures have their historical importance for edentulous patients, enabling an aesthetic, functional and socially acceptable restoration. Some patients treated with complete dentures also report improvements in their general health [2].

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Many patients cannot undergo surgical procedures associated with implants and prosthetics on implants, and such costs can be restrictive in some cases. Therefore, conventional complete dentures remain one of the most viable and recommended rehabilitation modalities for most cases of complete edentulism. Conventional methods for manufacturing conventional complete dentures include: two-step molding with the creation of an individual tray and assembly in a semi-adjustable articulator, using a face bow [3].

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In this context, the facebow is an important tool used to record the spatial relationship of the maxillary arch with some anatomical reference points, helping to transfer this relationship to an articulator. Thus, this procedure ensures that the model of the maxillary dental arch is oriented at an analogous or comparable distance to the articulator hinges [4].

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~~Evidence-based Dentistry advocates the conscious, clear and judicious use of the best scientific evidence to list the best techniques and decisions in the treatment of patients. The ultimate goal is to improve prognosis and patient satisfaction. Several professionals and institutions around the world are analyzing evidence for or against clinical procedures, medications, devices, materials and patient management protocols [5].~~

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In this sense, there are few comparative studies on the effectiveness of different approaches, and variation in clinical opinions about which is the best technique for performing CD [6]. Specifically, there is little scientific evidence that a more complex technique, including FA transfer, coupled with variations in materials and techniques, such as customized trays, results in a better clinical outcome than a simpler technique [7]. From this perspective, some authors question standard procedures in the construction of conventional complete dentures, such as the use of the face bow, as a fundamental step for the success of this type of prosthetic rehabilitation [8].

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Therefore, this literature review aims to compare conventional methods (using facebow) and alternative (without the use of the facebow), ~~to determine the real need for the use of this device~~, in relation to the precision and quality of oral rehabilitation with prostheses conventional totals.

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2. METHODOLOGY

2.1 Study selection

The present study is an integrative review whose bibliographical survey was carried out in the electronic databases of the websites: Medline, Scielo, Cochrane and Scopus. In these, to select the articles, the English descriptors "Face Bow" AND "Denture, Complete", "Face Bow" AND "Mouth Rehabilitation" and "Denture, Complete" AND "Mouth Rehabilitation" were crossed. The articles found were ~~arranged and selected based on careful reading and~~

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classification analysis of titles and abstracts, with concomitant application of the following inclusion and exclusion criteria:

2.2 Inclusion criteria

- (i) Articles published in the last 15 years;
- (ii) Articles in Portuguese and/or English;
- (iii) Controlled and/or randomized clinical trials;
- (iv) Articles that carried out comparisons of conventional complete dentures manufactured with or without the use of FB;
- (v) Articles that evaluate the efficiency of the face bow in different prosthetic procedures.

2.3 Exclusion criteria

- (i) Articles that do not assess the need for a face bow.
- (ii) Duplicate studies.

3. RESULTS AND DISCUSSION

This integrative literature review was carried out from 6 studies. The study selection and inclusion process was conducted from March 2024 to April of the same year. Figure 1 illustrates this stage, which presents the number of studies found, based on the initial data, using the descriptors mentioned previously, where stages (A) represent the stage in which the analysis of the Titles was carried out, (B) the application of the inclusion and exclusion criteria and (C) the final selection, after reading the articles selected in the previous stage. Regarding the selected studies, their main results are described in Table.

Figure 1. Search for studies, selection and inclusion of articles

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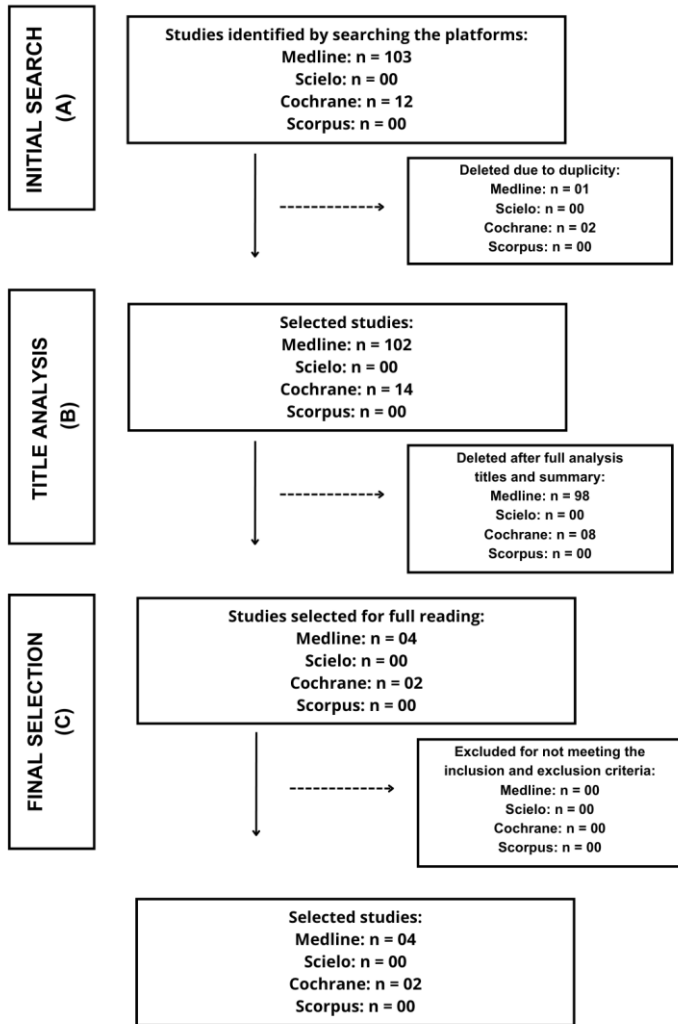


Table 1. Description of selected studies (title, author, objective and conclusions)

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Title	Author/year	Objective	Results
Does a face-bow lead to better occlusion in complete dentures? A randomized controlled trial: part I.	Von stein-Lausnitz et al. (2017)	To evaluate the impact of face-bow registration on the reassembly of conventional complete dentures.	No substantial difference in the use of the face-bow compared to an average configuration, in a total denture refitting procedure.
Comparative Evaluation of Two Techniques in Achieving Balanced Occlusion in Complete Dentures.	Kumar et al. 2010	To compare complete dentures made using two techniques: with the use of a face-bow and without the use of a face-bow, in dentures with balanced bilateral occlusion.	The technique without the face-bow showed better results in terms of length of stay, esthetics, comfort and stability. Balanced occlusion was achieved for both techniques.
Comparative Evaluation of Two Techniques in Achieving Balanced Occlusion in Complete Dentures.	Cunha et al. 2013	To compare a simplified method with a conventional protocol for making complete dentures, in terms of performance and masticatory capacity.	The simplified method is able to restore masticatory function to a level comparable to a conventional protocol, both physiologically and according to the patient's perception.
Influence of procedural variations during the laboratory phase of complete denture fabrication on patient satisfaction and denture quality.	Omar et al. 2013	To compare the subjective and objective results of complete dentures made using standard and simplified clinical protocols.	There were no significant differences in patient satisfaction or prosthesis quality between the two methods.
A randomized trial on simplified and conventional methods for complete denture fabrication: cost analysis.	Vecchia et al. 2013	To quantify the costs of making complete dentures using a simplified method compared to a conventional protocol.	The cost of the prosthesis was 34.9% lower for the simplified method.
Influence of a face-bow on oral health-related quality of life after changing the vertical dimension in the articulator: a randomized controlled trial. Part II.	Von stein-Lausnitz et al. (2017)	To assess the impact on quality of life following the use of full dentures reassembled using the face-bow.	The use of average values in CD reassembly is valuable. The face-bow was not perceived as superior.

In view of the results obtained, it is possible to observe the current reduced number of studies that worked on the perspective of comparing the manufacture of complete dentures with or without the use of FB, in which only 6 were found. Based on these, the results will be discussed below, evaluating points of consensus and discrepancies in the academic community, in addition to the main clinical perspectives and limitations of these studies.

When comparing the different methods for making complete dentures, in terms of performance and chewing ability, a study divided 42 patients into two groups and rehabilitated them with the conventional method (Group C) and the simplified method (Group S). These were evaluated for 3 months. Among the differences between the methods used in both groups was the use or not of FB. The conclusion reached was that both groups presented similar

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masticatory performance and only 1 item was preferred by the first group. Both methods are similar at a physiological level and in terms of the patient's perception [8].

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Furthermore, no considerable discrepancy was found regarding the reliability of the FB when compared to an average configuration given by the Bonwill triangle and the Balkwill angle when transferring from CD to ASA in normosystemic patients with adequate occlusion [3,9]. Furthermore, another study also found similar findings, where it was found that there were no significant differences in patient satisfaction or quality assessments of prostheses manufactured using the standard protocol compared to three simplified variations [10]. However, even from the patients' perspective, discrepancies can be seen based on the results of a study that investigated comfort and behavior during speaking and chewing after rehabilitation with and without the use of FB. A scale was applied to each patient, after using the two techniques, which contained the following alternatives: "Poor", "Satisfactory" and "Very good", the authors respectively obtained the following results: 0, 30 and 70% for the technique without FB, while that with the use of this device presented results of 25, 30 and 40% for the same scale [11].

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Concomitantly, regarding the impact on the quality of CD, it was found that even if bilateral balanced occlusion is obtained with both methods, avoiding the use of FB can directly positively influence their quality. The results demonstrated that, when comparing the numbers of occlusal contacts of the 2 techniques, the simplified alternative using a medium value articulator (Stratos 100, Ivoclar, Liechtenstein) was superior for all and with significant values for 50% of the tests (in relation to centric movement, right and left laterality and protrusion movements). Therefore, these average recordings performed without FB can contribute to obtaining a more balanced occlusion and, consequently, assist in the manufacture of CD with better fit, stability, comfort and aesthetics, also resulting in longer permanence time [11].

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Furthermore, when considering the clinical and economic aspects, there is a concern about the effectiveness and costs associated with the use of FB. Although some studies emphasize the clinical benefits provided by FB, it was observed that a simplified method for the complete construction of the dental prosthesis can restore masticatory function at least as well as the conventional protocol clinically and for the patient [8]. Another research, which addressed the analysis and quantification of cost-benefit in the manufacture of CD, obtained values of up to 34.9% financially lower for the simplified method in relation to the conventional method, which proved to be more costly for completely edentulous patients. In addition to highlighting the significant disparity in the clinical times required to perform conventional and simplified techniques for both the dentist and the Assistant, with an average difference of 111.3 and 15.1 minutes respectively [12].

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Given the above, it is important to consider that studies may vary in relation to the research methods used to evaluate the effectiveness of the face bow. These methodological variations can lead to different interpretations of the results and make comparisons between studies difficult. Some studies may emphasize specific aspects of oral rehabilitation, such as achieving a balanced and functional occlusion [9,12], while others may address a broader range of clinical outcomes and patient satisfaction [8,10,11,12]. These differences in emphasis may result in different conclusions about the effectiveness of FB in oral rehabilitation. Furthermore,

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given the small number of articles found, the continued need for research and debate in the area stands out, aiming to improve clinical practices for dentists and improve results for patients.

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4. CONCLUSION

Therefore, the data presented in this integrative literature review allow us to conclude that the use of the face bow does not result in major differences in the construction of conventional complete dentures and that simplified methods can be as effective as traditional ones. Added to this, the studies highlighted a reduction in costs and clinical working time, in the use of simplified methods, enabling treatment that is more accessible to the patient and advantageous to the dentist, producing prostheses with the same clinical effectiveness. Due to the low number of randomized clinical studies, we highlight the need for more studies in this area.

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REFERENCES

1. Driscoll Cf, Freilich Ma, Guckes Ad, Knoernschild Kl, MCGARRY Tj. O Glossário De Termos Protéticos, Gpt-9 J Prosthet Dent. 2017;117:E1–105
2. Prajapati, P. Et Al. A Clinical Study Of The Variation In Horizontal Condylar Guidance Obtained By Using Three Anterior Points Of Reference And Two Different Articulator Systems. Contemporary Clinical Dentistry, V. 4, N. 2, P. 162, 2013. 7
3. VON STEIN-LAUSNITZ, M. et al. Does a face-bow lead to better occlusion in complete dentures? A randomized controlled trial: part I. Clinical Oral Investigations, v. 22, n. 2, p. 773–782, 4 jul. 2017.
4. Kawai Y, Murakami H, Shariati B, Klemetti A, Blomfield Jv, Billette L, Et Al. Do Traditional Techniques Produce Better Conventional Complete Dentures Than Simplified Techniques. Journal Of Dentistry 2005;33:659–68
5. Shah, K.; Koka, S. Evidence-Based Practice And Barriers To Compliance: Face Bow Transfer. Journal Of Prosthodontic Research, V. 60, N. 1, P. 20–22, Jan. 2016.
6. Carlsson, G. E. Critical Review Of Some Dogmas In Prosthodontics. Journal Of Prosthodontic Research, V. 53, N. 1, P. 3–10, Jan. 2009.
7. Khan, F.; Ali, R.; Sheikh, A. Utility Of Facebow In The Fabrication Of Complete Dentures, Occlusal Splints And Full Arch Fixed Dental Prostheses: A Systematic Review. Indian Journal Of Dental Research, V. 29, N. 3, P. 364, 2018.

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8. Cunha, T. R. Et Al. A Randomised Trial On Simplified And Conventional Methods For Complete Denture Fabrication: Masticatory Performance And Ability. *Journal Of Dentistry*, V. 41, N. 2, P. 133–142, Fev. 2013.
9. A Holen Galeković, N. Et Al. Influence Of The Hinge Axis Transfer Modality On The Threedimensional Condylar Shift Between The Centric Relation And The Maximum Intercuspatation Positions. *Acta Stomatologica Croatica*, V. 49, N. 1, P. 36–44, 15 Mar. 2015.
10. OMAR, R. Et Al. Influence of procedural variations during the laboratory phase of complete denture fabrication on patient satisfaction and denture quality. *Journal Of Prosthodontic Research*, V 41, P 852-860, Oct 2013
11. Kumar, M.; D'souza, D. Comparative Evaluation Of Two Techniques In Achieving Balanced Occlusion In Complete Dentures. *Medical Journal Armed Forces India*, V. 66, N. 4, P. 362–366, Oct. 2010.
12. Vecchia, M. P. D. Et Al. A Randomized Trial On Simplified And Conventional Methods For Complete Denture Fabrication: Cost Analysis. *Journal Of Prosthodontics*, V. 23, N. 3, P. 182–191, 26 Jul. 2013.

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