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An Evidence-Based Approach to the Study of the Consequences of Partial Edentulism With and Without Prosthodontic Interventions

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The subject of evidence-based dentistry (EBD) is discussed frequently as a method to ensure appropriate decision-making for patient treatment. Sackett et al¹ describe evidence-based medicine (EBM) as a "conscientious, explicit, and judicious use of best-available evidence when making decisions" regarding the care of patients. The topics of EBD and EBM share a common heritage and mission. Unfortunately, EBD continues to be a misunderstood approach to dental education. Rather than accepting it as a straightforward method to incorporate clinical expertise with best-available evidence, many educators and clinicians appear to consider this approach as a threat to traditional dental therapy.

As part of an international training session for dental educators in EBD methodology, a group of mentors were assigned specific questions that would be addressed using best-available evidence. This evidence was to be identified through reviews of the literature recognizing that there are many approaches to the conduction of a literature review.²

The primary aim of this exercise was to identify different methods of evidence-gathering techniques related to the clinical question of what consequences a patient will face with or without prosthetic intervention for a condition of partial edentulism.

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Methods and Materials

Three different approaches to literature searches were identified and utilized. All approaches began with a comprehensive identification of terms that could be applied to the partial edentulism condition or to the consequences of partial edentulism. The list of terms was established through a "brainstorming" approach engaging a number of clinicians and educators in an attempt to develop the most comprehensive list of possible terms related to the primary topic. Those involved in the brainstorming effort were encouraged to be unencumbered by any limiting factors. Any tangential terms were preferably included rather than excluded from the master list.

Once the master list of terms related to the primary topic was established, the search was conducted using one of three different approaches. These three approaches are described as the traditional, systematic, and focused systematic review of the literature.

The traditional approach to a literature review involves the compiling of articles related to a specific topic. This may be accomplished through a handsearch of familiar journals, review of references from favored textbooks, use of traditional literature databases such as Index Medicus, or some combination thereof.

A systematic review is one that establishes specific criteria for inclusion or exclusion of articles identified from the electronic literature search. Systematic reviews should be comprehensive in nature. These reviews may utilize one or many electronic databases such as MEDLINE, PubMed, Scopus, EMBASE, or the Cochrane Database of Systematic Reviews. Once an electronic search is conducted, the investigators will evaluate the titles and abstracts of the identified manuscripts to identify relevant studies. Once these are identified, the complete article is evaluated and if it continues to meet the inclusion criteria of the search, it can then be utilized in the final systematic review. The final review articles are then reread, information is compiled, and commentary and/or conclusions are derived from the material.

When a systematic review is conducted to address a focused question, the goal of this approach may be to extract data and synthesize specific answers even though the individual studies may have been underpowered. The reason for this is that data are accumulated among the included studies. This process starts with the establishment of a specific question known as the PICO question. The question identifies four distinct areas of concern whereby "P" refers to the patient or problem, "I" refers to the intervention, "C" refers to the comparative intervention, and "O" refers to the clinical outcome of interest. Through the establishment of a PICO question, the investigative team is able to gain appreciation from the results of a fair comparison.

To illustrate the use of these three methods, the literature reviews were used to identify the positive or negative effects of tooth replacement in partially edentulous patients. Using the traditional method, the question was left purposefully vague while the systematic review identified the shortened dental arch and masticatory performance as the two items of interest. Finally, the focused review evaluated patients who were partially edentulous (P) who did (I) or did not receive dental prostheses (C) to determine their nutritional intake (O).

Results

Traditional literature reviews provide descriptive information on a specific topic. The information may be broad-based or narrowly focused. Since the literature review is conducted in an effort to identify appropriate treatment for patients with specific presenting conditions, it is a disservice to the patient if a review such as this is conducted in a narrow way. The likelihood for bias in that situation is great. Even if the review itself is conducted broadly, it is still possible that the reviewers could interpret the literature using personal biases. Considering these two factors, it is apparent that traditional literature reviews are limited in their ability to identify clearly superior treatment, even if such superiority could be identified through a literature review.

Systematic reviews provide a greater chance of identifying superior treatment alternatives since systematic reviews create a more unbiased literature bank. It is apparent, however, that specific inclusion or exclusion criteria could be developed that may result in propagation of an investigator bias.

The use of a PICO question in combination with a systematic review of the literature is more likely to identify meaningful differences in clinical intervention if such differences truly exist. This approach makes it more difficult to include bias in this type of study.

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