

# Bias in Dental Sleep Medicine Research: Does it Matter to Clinicians?

Leslie C. Dort, DDS, Diplomate, ABDSM, Editor-in-Chief *Journal of Dental Sleep Medicine*

Calgary, Alberta, Canada

Bias is “systematic error introduced into sampling or testing by selecting or encouraging one outcome or answer over others.”<sup>1</sup>

Scientific studies are likely to be subject to various types of bias that could limit the generalizability of the results. As clinicians, we need to be aware of potential sources of bias and how they may be relevant to our specific patient populations.

Recognition and avoidance of bias in scientific research has been very well described.<sup>2,3</sup> Some familiarity with sources of bias gives clinicians tools to critically evaluate the literature.

Study designs of oral appliance outcomes, even randomized controlled trials, may have *selection bias* if the subjects included were limited to those: who have failed CPAP or are CPAP naïve, are of limited age range, are free of the common comorbidities associated with OSA, are compliant with therapy, or have been selected from limited clinical populations. Other designs risk bias when no control group is included. In studies reporting on oral appliance outcomes with no control group, one cannot know—for example—how many subjects may have developed TMJ symptoms or dry mouth over the course of time when not using oral appliances.

There may be systematic differences in the way patients were treated that could introduce *performance bias*. It is very difficult to blind investigators to what treatment subjects are getting and therefore investigators may unintentionally give different attention to one group over another. Some studies report on drop outs and use an intention to treat analysis. Others only include those who complete the protocol—a potential source of *attrition bias*. *Reporting bias* may also be present depending on the criteria used to determine which subjects’ data is included in the analysis.

The use of questionnaires that have not been validated may introduce *instrument bias*. Non-validated questionnaires may have questions that inadvertently influence the answers that patients give. Subjects are likely to have *recall bias* when

questioned regarding outcomes or side effects depending on time since they occurred. Compared to a general clinic population, subjects who know they are part of a study may be more or less willing to use an oral appliance despite questionable outcomes or significant side effects.

Keeping potential sources of bias in mind will help clinicians interpret study results and consider the relevance of the results to clinical practice.

## CITATION

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Address correspondence to: Leslie C. Dort, DDS, 1016-68th Ave SW, Suite 150, Calgary, AB T2V 4J2, Canada; Tel: (403) 202-4905; Fax: (403)202-0266; Email: lcdort@gmail.com

## DISCLOSURE STATEMENT

Dr. Dort is Editor-in-Chief of the *Journal of Dental Sleep Medicine*.