

Editorial

Minimizing publication bias

A few years ago a study obtaining negative results would not have been submitted for publication by the researchers because they would have considered the results to be “uninteresting”, “disappointing” or “not worthy of publication”. Some researchers may have withheld negative findings and/or important detail from their manuscripts so that readers could not determine if the results were valid and/or applicable in their practices. This selective underreporting of research is known as “publication bias”, and in the medicine it is considered to be more widespread and more likely to result in adverse consequences for patients than publication of deliberately falsified data. In the past reviewers and editors have contributed to publication bias because they have tended to recommend and/or accept manuscripts for publication based on the direction and statistical strength of the findings, the gender and/or academic rank of the researchers.

Although these observations of publication bias have been drawn from the medical literature they may apply to orthodontics which, as a profession, appears to have made a practice of publishing positive results and/or studies with inadequate detail. One of the difficulties in determining the extent of publication bias in orthodontics would be to track down unpublished studies with negative results. Reports to grant agencies, university theses and research reports, conference abstracts, and even a questionnaire circulated to the profession might give us a crude estimate of publication bias in our profession. There are, however, some things we can do to minimize the problem. The first is to make clear to researchers that we at the *Australian Orthodontic Journal* base our

decisions whether to accept or not to accept an article for publication on issues of quality and logical reasoning by authors rather than the direction and strength of the evidence. We will continue to avoid potential sources of bias in the initial assessment of a manuscript, the choice of peer reviewers, how reviewers’ reports are handled, and final evaluation of a manuscript. Furthermore, because factors such as the gender of the researchers, academic rank, and source of funding have been shown to be important sources of bias, we will be changing the layout of the Journal. Publication bias can be reduced by insisting on high-quality research and thorough literature reviews, by eliminating the double standard concerning peer review and informed consent applied to clinical research carried out in institutions but not studies based in practices, by publishing legitimate trials regardless of results, requiring peer reviewers to acknowledge conflicts of interest, replacing review articles with meta-analysis, and requiring authors of reviews and new methods to acknowledge possible conflicts of interest.

What then are the consequences of publication bias? Biased underreporting of research can have serious consequences for patients who are expected to accept the unwanted side-effects of ineffective treatments; to accept advice based on evidence that is less complete than it need be about the effects of orthodontic care; to be invited to participate in clinical research that has been conceived and designed on the basis of incomplete information; and to contribute to research, both as indirect funders and subjects, that may not be published if the results are an embarrassment to the researchers or their sponsors. To minimize publication bias all well-designed trials/studies, large and

small, with positive and/or negative results, that contribute to knowledge should be published. Publication bias leads to systematic errors in the evaluation of treatments and is, to put it bluntly, scientific misconduct because it can lead clinicians to make inappropriate decisions about the diagnostic and/or treatment methods they use.

In this issue of the Journal the study "Facio-lingual width of the alveolar base" by Prapart Wonglamsam, Montien Manosudprasit and Keith Godfrey, which reports negative results, was the stimulus for this editorial. This article is recommended because it is a careful attempt to find a useful method of predicting the facio-lingual width of the alveolar base using measurements taken from conventional cephalometric radiographs. It contains a detailed description of the background to the study. This issue also contains a paper by Keith Grave and Grant Townsend reporting the use of the cervical vertebral maturation as a predictor of the timing of peak growth in both stature and the mandible. This is a method that can be used by orthodontists to assess a child's growth activity and, thus, may be useful in timing therapy that depends to some extent on growth. Surface corrosion of archwires that can weaken stainless steel archwires to the point of fracture is the subject of the carefully researched paper by Ji-Soo Shin, Keun-Taek Oh and Chung-Ju Hwang. Their results indicate stainless steel archwires should be replaced frequently. Nickel titanium archwires, on the other hand, are relatively free of corrosion, particularly if the researchers' recommendation is followed. The final paper in this issue is a clinical study of open gingival embrasures following orthodontic treatment. Since reading this manuscript I have noticed that open gingival embrasures are more common in our patients than many of us would like to admit. Masaru Yamaguchi and his team of researchers, headed by Natsue Ko-Kimura, report that those annoying dark spaces are more likely to be due to resorption of the alveolar crest than extrusion of the mandibular incisors. Each paper in this issue raises many unanswered questions which we hope the researchers will follow up and eventually submit to the Journal for publication – even if the results are negative.

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