Bias

Bias is an inclination of temperament or outlook to present or hold a partial perspective, often accompanied by a refusal to consider the possible merits of alternative points of view. People may be biased toward or against an individual, a race, a religion, a social class, a political party, or a species.

Biased means one-sided, lacking a neutral viewpoint, or not having an open mind. Bias can come in many forms and is often considered to be synonymous with prejudice or bigotry.

Bias is a systematic error in the design, recruitment, data collection, or measurement that results in a mistaken estimation of the true effect of the exposure and the outcome. The reviewer must be aware of poten- tial study bias because the smaller the bias the higher the chance of finding the truth. The types of study biases are selection, allocation or indication, treatment, and measurement or detection bias.

In selection bias, the bias can occur when enrolled patients are not representative or there is a misdiagnosis of the target patient population or retention of participants. Recommendations to the authors include: describe all the eligibility criteria, include all patients, and maintain tracking and communications with them.

Allocation or indication bias occurs when patient allocation to the treatment is influenced by prognostic factors or physician's willingness. Recommendations to the authors include: some type of allocation needed; the best is patient allocation by a computer-generated procedure.

Treatment bias occurs when the patient maintenance and compliance with the study are not appropriate, re- sulting in different postoperative patient care between the groups and losses of follow-up or crossover between the therapy arms. Recommendations to the authors are: blind- ing the clinical staff involved in the postoperative treatment and standardizing the pre- and postoperative routine care, such as physiotherapy and medication drugs and dosage.

Measurement or detection bias occurs when patient follow-up and outcome assessment differ between the groups or an inaccurately calibrated instrument creates a systematic error. Recommendations to the authors include: blinding the evaluator, use of objective and not subjective instruments to measure the endpoints, and standardized follow-up visits, ensuring the same chances to detect com- plication.

Questions to be answered by the reviewers are:

1) was the study performed according to the original protocol

2) are the results valid and near the truth

3) are there selection systematic errors or bias

4) are there allocation systematic errors or bias

5) are there treatment systematic errors or bias

6) are there measurement systematic errors or bias

7) are there many confounding factors

8) is there an appropriate sample size calculation, adequate allocation, good study design, blinding techniques, intention-to- treat analysis, and completeness of follow-up

9) are the methods described clearly enough for other researchers to replicate

10) are the study limitations described in the discussion

11) do the data and results justify the authors' conclusions?

The core premise of evidence based medicine is that clinical decisions are informed by the peer reviewed literature. To extract meaningful conclusions from this literature, one must first understand the various forms of biases inherent within the process of peer review.

Hirshman et al., performed an exhaustive search that identified articles exploring the question of whether survival benefit was associated with maximal high grade glioma (HGG) resection and analysed this literature for patterns of publication. They found that the distribution of these 108 articles among the 26 journals to be non-random (p<0.01), with 75 of the 108 published articles (69%) appearing in 6 of the 26 journals (25%). Moreover, certain journals were likely to publish a large number of articles from the same medical academic genealogy (authors with shared training history and/or mentor). They term the tendency of certain types of articles to be published in select journals 'journal bias' and discuss the implication of this form of bias as it pertains to evidence-based medicine [1].

Cognitive bias

Cognitive bias.

Selection bias

Selection bias.

[1]

Hirshman BR, Jones LA, Tang JA, Proudfoot JA, Carley KM, Carter BS, Chen CC. 'Journal Bias' in peer-reviewed literature: an analysis of the surgical high-grade glioma literature. J Neurol Neurosurg Psychiatry. 2016 Nov;87(11):1248-1250. doi: 10.1136/jnnp-2015-312998. PubMed PMID: 27118036.

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