

Rate of Positive Outcome Reporting in 2021 for an Academic Department of Orthopaedic Surgery

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INTRODUCTION:

Publication bias describes the phenomenon in which scientific results are more likely to be reported and accepted for publication based on the presence of statistically significant or favorable outcomes of a specific treatment strategy that are systematically unrepresentative of the population of completed studies. A high rate of positive reporting may ignore pertinent information derived from unpublished studies with unfavorable outcomes. Compared to “hard” sciences such as space science and geosciences, clinical medicine demonstrates a higher rate of papers that report positive support for the tested hypothesis. A prior review of orthopaedic literature described the rate of positive outcome reporting to be as high as 74%. The purpose of this study was to assess the rate of positive outcome reporting among faculty members of orthopaedic surgery and assess if the rate of positive outcome reporting remains constant across various levels of evidence.

METHODS:

A comprehensive review was performed of 510 scientific articles published between January 1, 2021, and December 31, 2021, among the entire faculty at a large, urban academic institution, comprehending the whole Department of Orthopaedic Surgery. Screening of articles was performed by two investigators (ZS & RL) according to an algorithm defined by Hasenboehler et al. 2007 to qualify each article as “positive,” “negative,” or “neutral.” Positive outcomes were defined as articles with significant differences between the study groups with positive conclusions and/or positive recommendations, favorable clinical outcomes, positive data derived from basic science studies, or the identification of relevant independent variables, risk factors, etc. which contribute to a favorable outcome. All non-original research (i.e., systematic reviews and meta analyses) were excluded. The level of evidence for each article was defined by the criteria set forth by an updated assignment of levels of evidence in the Journal of Bone and Joint Surgery. Chi-squared tests were utilized to compare the relationship between the evidence levels and the articles' outcomes. All statistical analysis was performed in the same statistical program.

RESULTS:

Out of 510 articles published, 328 were included. Most articles were Level III (n=212, 64.6%), followed by Level IV (n=66, 20.1%), Level II (n=32, 9.8%), and Level I (n=18, 5.49%). Out of the three categories, there were more positive articles (n=149, 45.4%) than negative articles (n=124, 37.8%) or neutral articles (n=55, 16.8%). There was a significant association between article outcome and levels of evidence (p<0.001). Articles with Levels IV and II had over 50% positive outcomes, whereas the ones considered Level III reported predominantly negative outcomes. Level I studies had a predominance of neutral or positive outcome reporting.

DISCUSSION AND CONCLUSION:

While positive outcomes were reported more often than negative or neutral outcomes, the rate of positive outcome reporting among this academic orthopaedic tertiary care center is not as high as rates reported in orthopaedic literature in the past, nor is it as high as the rate among clinical medicine. Case series and prospective cohort studies have high levels of positive outcome reporting, while case-control studies demonstrate higher rates of adverse outcomes. Randomized control trials had the highest rate of neutral studies, which may imply that the scientific rigor of a study makes it more difficult to achieve statistical significance.

Figure 1: Hasenboehler et al. 2007 criteria

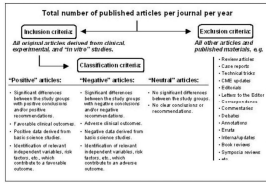


Figure 2: Study Selection Flowchart

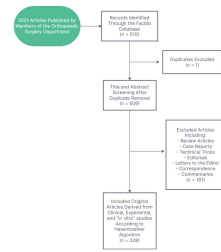


Table 1: Article Outcomes and Level of Evidence

Level of Evidence	Outcome			P Value
	Negative	Neutral	Positive	
I, n (%)	7 (11.7)	8 (14.4)	8 (14.4)	<0.001
II, n (%)	11 (34.4)	2 (6.2)	19 (59.4)	
III, n (%)	91 (82.9)	40 (38.5)	81 (84.2)	
IV, n (%)	30 (30.3)	5 (7.6)	41 (62.1)	