

Understanding the Importance, Utility, and Responsible Application of the H-index in Orthopedics

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Learning Point of the Article:

Although the H-index is a valuable indicator of sustained academic impact in orthopedics, its responsible interpretation requires balancing bibliometric performance with clinical relevance, ethical publishing practices, and the educational value of case-based research.

Introduction

The evaluation of academic performance in medicine has evolved considerably over the last few decades. Orthopedics, like many other clinical specialties, has witnessed a transition from predominantly qualitative assessments of scholarly merit toward increasingly quantitative, metric-based systems.

Academic productivity, once judged largely on peer reputation, institutional standing, and subjective appraisal of scientific contribution, is now frequently summarized through bibliometric indicators. Among these, the H-index has emerged as one of the most visible, widely adopted, and influential measures of scholarly impact. Its prominence has extended beyond individual career progression to influence journal governance, peer-review structures, institutional benchmarking, and research funding decisions [1].

For the Journal of Orthopaedic Case Reports (JOCR), a journal dedicated to clinically relevant, case-based scholarship, the growing emphasis on bibliometric indicators presents both opportunities and challenges. While case reports are foundational to clinical learning and hypothesis generation, they traditionally attract fewer citations than large clinical trials or systematic reviews. In such a landscape, understanding the role

of the H-index – its strengths, limitations, ethical implications, and appropriate use – is critical to ensuring that metrics enhance, rather than distort, the mission of orthopedic publishing.

This editorial seeks to provide a comprehensive and nuanced discussion on the importance of the H-index in contemporary orthopedic academia, with specific reference to JOCR. It explores the conceptual foundations of the H-index, its influence on journals and authors, its limitations within orthopedics, and the principles of responsible metric use that should guide editorial policy and academic evaluation.

Evolution of Bibliometrics and the Emergence of the H-index

Bibliometrics originated as a tool for studying patterns in scientific communication rather than as an instrument for individual evaluation. Early indicators, such as publication counts and total citation numbers, were crude but easily measurable proxies of academic activity. However, these measures were soon recognized as inadequate. A high publication count did not necessarily reflect influence or quality, whereas total citations could be skewed by a single highly cited article, masking otherwise limited scholarly contributions.

In 2005, Hirsch proposed the H-index as a solution to these

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shortcomings, aiming to capture both productivity and impact in a single metric [1]. According to this definition, a researcher has an H-index of h if h of their publications have received at least h citations. The index thus rewards sustained scholarly influence rather than isolated success or sheer volume of publications. Its rapid adoption across disciplines reflected the academic community's desire for a simple, seemingly fair, and easily interpretable indicator.

Hirsch later suggested that the H-index might also possess predictive value, correlating with future research performance and continued citation accrual [2]. Although this claim remains debated, it further contributed to the metric's widespread acceptance. Today, the H-index is routinely displayed on academic profiles, institutional websites, and bibliographic databases, and is frequently considered – formally or informally – in academic appointments, promotions, fellowship selections, and editorial board nominations.

The Appeal of the H-Index in Orthopedic Academia

Orthopedics is a broad specialty encompassing diverse subspecialties, research methodologies, and publication cultures. From basic science and biomechanics to clinical trials, registry-based studies, and case reports, the spectrum of orthopedic research is wide.

In such heterogeneity, evaluators often seek standardized tools to compare academic output across individuals and institutions. The H-index, despite its imperfections, offers a convenient summary measure.

One of the principal reasons for the H-index's popularity is its simplicity. Unlike more complex, field-normalized metrics, it can be understood without specialized bibliometric training. It is also relatively robust to extreme values, as it is not disproportionately influenced by a single highly cited paper or by numerous poorly cited publications [1]. For busy clinicians and administrators, this balance is attractive.

In orthopedics, where clinical workload is substantial and research time is often limited, the H-index is sometimes interpreted as evidence of sustained academic engagement despite service commitments. Consequently, it has become embedded in academic culture, shaping perceptions of credibility, expertise, and leadership potential. This reality underscores why journals such as JOCR cannot ignore the metric, even if they do not endorse its uncritical use.

Relevance of the H-index for JOCR as a Case-report Journal

JOCR occupies a distinctive niche within orthopedic literature. Case reports, by design, focus on individual or small series of

patients, often highlighting rare conditions, unusual presentations, complications, or innovative management strategies. Their primary value lies in education, clinical awareness, and hypothesis generation rather than in producing high-level evidence or large citation volumes.

Nevertheless, the journal operates within an academic ecosystem that increasingly values metrics. The H-index becomes relevant for JOCR in several indirect but meaningful ways. Editorial board composition, reviewer selection, and journal perception are all influenced – explicitly or implicitly – by the academic profiles of those associated with the journal. Editors and reviewers with established scholarly records, often reflected in higher H-index values, lend credibility and confidence to the peer-review process.

For potential authors, especially those in academic institutions, the perceived standing of a journal influences submission decisions. While authors may not explicitly evaluate a journal based on the H-index of its editors, the academic reputation of the editorial leadership contributes to the journal's overall image. In this sense, the H-index functions as a reputational signal rather than a direct quality determinant.

At the same time, JOCR has an important role in shaping how metrics are interpreted within the orthopedic community. By emphasizing rigorous peer review, ethical publication practices, and educational value over metric optimization, the journal can model responsible engagement with bibliometrics.

Impact of the H-index on Editorial Leadership and Peer Review

The quality of a journal is inseparable from the quality of its editorial processes. Editors and reviewers are entrusted with evaluating scientific rigor, clinical relevance, ethical integrity, and originality. While these competencies cannot be reduced to numerical indicators, bibliometric measures such as the H-index are often used as preliminary screening tools when identifying potential editorial board members or reviewers.

In the context of JOCR, the H-index can serve as a contextual indicator of sustained engagement with scientific publishing. Individuals with a consistent citation record are likely to be familiar with scholarly standards, peer-review expectations, and ethical considerations. However, reliance on the H-index alone risks excluding capable clinicians and educators whose contributions may not translate into high citation counts, particularly in case-based or region-specific research.

A balanced approach is therefore essential. The H-index should complement, not replace, qualitative assessment of clinical expertise, methodological competence, subject relevance, and commitment to peer review. Such an approach aligns with

broader recommendations that emphasize expert judgment as the cornerstone of research evaluation [3,4].

Author Development, Case Reports, and the H-index Trajectory

For early-career orthopedic surgeons and trainees, case reports often represent the first step into academic publishing. Although individual case reports may attract modest citation numbers, their cumulative impact should not be underestimated. High-quality case reports that clearly articulate novelty, contextualize findings within existing literature, and identify learning points can influence clinical practice and future research directions.

Over time, citations to such reports contribute incrementally to an author's citation profile and, consequently, their H-index. Importantly, case reports often seek subsequent studies, reviews, or larger series, indirectly amplifying their academic influence. JOCR, by maintaining high reporting standards and encouraging thoughtful discussion, can enhance the legitimate citability of its publications.

This developmental role is particularly significant in regions where access to large research infrastructure may be limited. By providing a platform for clinically meaningful scholarship, JOCR supports inclusive academic growth while reinforcing the principle that impact should be defined by contribution to knowledge rather than by metric accumulation alone.

Strategic Publishing Considerations and Citation Ethics

In an era where bibliometric indicators influence journal visibility and indexing prospects, editorial strategy inevitably intersects with citation dynamics. However, the pursuit of higher citation metrics must never compromise editorial independence or ethical standards. Practices such as coercive citation, excessive self-citation, or preferential acceptance based on citation potential undermine trust in scientific publishing.

For JOCR, the appropriate strategy is not to chase citations but to prioritize content quality, relevance, and educational value. Reviews, technique notes, and perspective articles may naturally attract more citations than individual case reports, but their inclusion should be driven by genuine clinical need rather than metric considerations. When citations arise organically from usefulness and rigor, they reflect authentic impact.

This approach is consistent with international guidance on responsible metrics, which cautions against using citation-based indicators as proxies for quality or as targets in themselves [3,4].

Limitations of the H-index in Orthopedics

Despite its widespread adoption, the H-index has well-documented limitations that are particularly pronounced in orthopedics. One major concern is field dependency. Citation practices vary widely across subspecialties. For example, spine surgery, arthroplasty, and sports medicine often generate higher citation volumes than pediatric orthopedics or musculoskeletal oncology case series. Consequently, comparing H-index values across subspecialties is methodologically inappropriate [4].

Another significant limitation is career-stage bias. The H-index is cumulative and non-decreasing, inherently favoring senior researchers. Early career clinicians, regardless of the quality or promise of their work, are structurally disadvantaged. Bornmann and Daniel emphasized that the H-index lacks sensitivity to recent performance and may obscure emerging excellence [5].

Database variability further complicates interpretation. H-index values differ depending on whether they are calculated using Web of Science, Scopus, or Google Scholar, each of which has different coverage and indexing rules [6, 7]. Without specifying the data source, reported H-index values lack transparency and comparability.

From a theoretical standpoint, the H-index has also been criticized for internal inconsistency. Waltman and van Eck demonstrated that under certain conditions, the index can produce counterintuitive rankings, challenging its validity as a universal impact measure [8]. These critiques reinforce the need for caution and contextualization in its use.

Responsible Use of Metrics: Global Guidance and Implications for JOCR

Recognition of the limitations of bibliometric indicators has led to global initiatives promoting responsible research assessment. The San Francisco Declaration on Research Assessment explicitly discourages the use of journal- or author-level metrics as substitutes for qualitative evaluation of research content [3]. Similarly, the Leiden Manifesto outlines principles emphasizing transparency, field normalization, and the primacy of expert judgment [4].

For JOCR, adherence to these principles is not merely symbolic. As a journal rooted in clinical education and case-based learning, it must actively resist the marginalization of valuable scholarship that may not generate high citation counts. Metrics such as the H-index should be interpreted as descriptive tools that provide context, not as definitive measures of quality or worth.

Alternatives and Complements to the H-index

Numerous alternative and complementary metrics have been proposed to address the shortcomings of the H-index. The G-index, for example, gives greater weight to highly cited publications and may better capture breakthrough contributions [9]. More recently, standardized citation indicators that normalize for field, authorship position, and career stage have been developed to improve fairness and comparability [10].

While these tools offer incremental improvements, none fully resolve the inherent complexity of evaluating scientific contribution. For journals like JOCR, the solution lies not in adopting ever more sophisticated metrics, but in cultivating a culture of thoughtful, transparent, and ethically grounded evaluation.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conclusion

The H-index has become an integral part of modern academic orthopedics, influencing individual careers, institutional policies, and journal ecosystems. When used responsibly, the H-index can assist in understanding patterns of scholarly engagement and support structured editorial processes. When used uncritically, it risks oversimplifying evaluation, disadvantaging early-career clinicians, and undervaluing clinically important case-based scholarship. JOCR is uniquely positioned to demonstrate best practice by reaffirming that metrics should support, not supplant, expert judgment and clinical relevance.

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