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Analysis of Journal Impact Factor (IF), Q Score, and h-Index: A Critical Perspective

Dergi Etki Faktörü (IF), Q Değeri ve h-indekslerinin Analizi: Eleştirel Bir Bakış

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ABSTRACT

One of the earliest concepts related to citation indexes (impact factor-IF) was proposed by Eugene Garfield in 1955. Although the first scientific journals (Journal des Sciences and Philosophical Transactions of the Royal Society of London) began publication in France and England in 1665, the idea that scientific journals vary in quality was first articulated by Bradford in 1934. The use of the h-index and journal Q-values began long after the adoption of the IF; however, all three analytical sources are interrelated in terms of citation metrics and are widely used today. However, the use of these analytical sources has always been a subject of debate due to various limitations. While it's impossible to completely abandon these analytical resources, their use can be restricted, particularly in academic appointments, promotions, awarding prizes, etc., and their use as the sole criterion can be reduced. One of the most important criteria to consider should be quality, and this quality measure should be used in conjunction with these analytical resources, with evaluations conducted accordingly.

Key Words: Journal Impact Factor, Q Scores, h index

ÖZ

Atıf dizinleriyle ilgili en eski kavramlardan biri (etki faktörü - IF), 1955 yılında Eugene Garfield tarafından ortaya atılmıştır. İlk bilimsel dergiler (*Journal des Sciences* ve *Philosophical Transactions of the Royal Society of London*) 1665 yılında Fransa ve İngiltere'de yayımlanmaya başlamış olsa da, bilimsel dergilerin nitelik bakımından farklılık gösterdiği fikri ilk kez 1934 yılında Bradford tarafından dile getirilmiştir. h-endeksi ve dergi Q-değerlerinin kullanımı, IF'nin benimsenmesinden çok daha sonra başlamıştır; ancak bu üç analitik gösterge de atıf metrikleri açısından birbiriyle ilişkilidir ve günümüzde yaygın olarak kullanılmaktadır. Bununla birlikte, çeşitli sınırlamalar nedeniyle bu analitik göstergelerin kullanımı her zaman tartışma konusu olmuştur. Bu analitik kaynaklardan tamamen vazgeçmek mümkün olmasa da, özellikle akademik atamalar, yükseltmeler ve ödül verilmesi gibi süreçlerde kullanımları sınırlandırılabilir ve tek kriter olarak değerlendirilmelerinin önüne geçilebilir. Dikkate alınması gereken en önemli kriterlerden biri nitelik olmalı; bu nitelik ölçütü söz konusu analitik kaynaklarla birlikte kullanılmalı ve değerlendirmeler buna göre yapılmalıdır.

Anahtar Kelimeler: Dergi Etki Faktörü, Q Puanları, h-endeksi

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Introduction-Brief History

One of the earliest ideas regarding citation indexes was proposed by Garfield in 1955. Garfield [1-2] discussed the need for a citation index and also addressed its benefits. In his 1955 study, Garfield also discussed the history of the subject, noting that as early as 1873, a research tool known as “Shepard’s Citations”-published by Shepard’s Citations, Inc. (Colorado Springs, Colo.)-had been made available to the legal

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community. Garfield may have been influenced by “Shepard’s Citations” when developing the concept of a “citation index for science,” this can not be confirmed.

In fact, even before Garfield’s 1955 publication [1], this issue had been highlighted by Gross and Gross [3] and Bradford [4]. Gross and Gross [3] also pioneered the citation model in the 1920s. In other words, although the first scientific journals (Journal Des Scavans and Philosophical Transactions of the Royal Society of London) began publication in France and England in 1665, the view that scientific journals vary in quality was articulated by Bradford in 1934 [4]. Bradford observed that only a very small fraction of the 1,000 journals he examined published significant scientific results, that some journals formed the foundation of the literature, and that most important research was published in specific journals (Bradford’s Law). This finding demonstrated that scientific journals are not of equal quality. Similarly, Brodman [5] conducted research on the indexing and coverage process of journals in the field of physiology and highlighted the differences among scientific journals.

Purpose of the Study

Analytical sources such as journal Q-values, h-index and Impact Factor (IF), whilst being of great importance in reflecting journal quality and, to a lesser extent, in academic promotions and the promotion of journals, are controversial concepts. They must therefore be used with caution. This study examines the limitations associated with the use of these analytical indicators, despite their importance, and offers recommendations on how they should be utilised. The purpose of this study is to emphasise that, particularly in academic promotions, alongside quantitative measures such as the journal in which a scientific article is published, the h-index, and the number of citations an article receives, the qualitative aspects of the articles must also be considered.

Impact Factor (IF)

There are various methods for measuring the impact of scientific studies. The Impact factor (IF) value was developed for this purpose. Developed for scientific journals, the IF can also be used to measure the impact of an academic's scientific work, publications from a country, and publications citing a specific city. This concept provides information about how widely a publication reaches its target audience, by whom, in which publications, and to what extent it is cited. It also provides information about the distribution of these citations over time (e.g., by year). According to Garfield [6], the development of citation indexes has not only improved the productivity of journals but has also enabled the preparation of statistical reports and the development of the concept of citation frequency.

The IF value is calculated using data from a two-year period (five-year IF values are also calculated, but two-year IF values are more commonly considered). A journal's IF is obtained by dividing the number of citations received in the last year for articles published in the previous two years by the number of articles published in the previous two years. Let's explain how this calculation is done using journal A as an example. Formula: Number of citations in the following year (2025) for articles published in journal (A) in the previous two years (e.g., 2023 and 2024) / Number of articles published in that journal in the specified two years (2023 and 2024) = 2025 IF. The works in the denominator include only research articles and reviews; other publications such as editorials and conference abstracts are not included. In other words, editorial material, news headlines, book reviews, corrections, letters, notes, retraction publications, and conference abstracts, etc., are not considered in citation calculations [7]. It's possible to explain how the IF value is calculated with an example: Let's say that articles published in journal A in 2023 and 2024 received 400 citations in 2025. If journal A published a total of 100 articles in 2023 and 2024, then the IF value for journal A in 2025 would be 400/100 = 4.

The Web of Science (WOS) Main Collection includes 8 indexes, and there are 7 indexes outside the main collection (WOS database) (Accessed: June 4, 2026). AHCI and ESCI were added to Journal Citation Indicator (JCI) in 2021. Until 2023, IF values for journals indexed in AHCI and ESCI were not published; however, they are included in the JCR list from 2023 onwards. In

2026, 521 journals received the IF for the first time [8].

Some Limitations of IF Values

One should be cautious when quickly appointing academics with publications in journals with high IF values and/or awarding various prizes to academics who publish in these journals, because IF is a controversial concept and has many limitations [9]. IF should not be used as the sole parameter in the evaluation of scientific journals because, for example, review publications generally receive many citations; therefore, if IF is the only parameter, journals that only publish reviews will easily come to the forefront. For example, five of the top 10 journals with the highest IF values in WOS 2025 consisted only of journals that published reviews [Top 10 journals: CA-A Cancer J For Clinicians, IF value: 685.2; Nature Rev. Mol. Cell Biol.-IF 118.0; Lancet-IF 109; Nature Rev. Microbiol-IF 104.6; MMWR Surveillance Summaries-IF 96.9; Nature Rev. Clin. Oncol.-IF 94.6; Nature Rev. Drug Discovery-IF 91.2; New Eng. J. Med.-IF 84.5; Nature Rev. Materials-IF 83.3; Signal Transduction and Targeted Therapy-IF 81.2] [10] Access: 15.7.2026).

Until 2023, WOS added three more digits after the decimal point to the IF value when publishing it. However, after 2023, it changed this and started adding only one digit after the decimal point to the IF value. For example, while Atmospheric Pollution Research's 2021 IF value was given as 4.831, its 2025 IF value was given as 3.9, meaning there was only one digit after the decimal point instead of three. Why? It's difficult to give a definitive answer. However, Asan and Aslan [11] drew attention to this situation in their study. This article provides various limitations regarding the use of the Q value. A journal's Q value is entirely dependent on its IF value. For example, let's assume there are 200 journals in field C. In this case, the top 50 journals with the highest IF values would be Q1, the next 50 would be Q2, the next 50 would be Q3, and the fourth 50 would be Q4. A journal's Q-score influences the academic promotions of researchers who publish in that journal and is used to award prizes to academics. Continuing with the example given above, the top 50 journals with the highest IF (Individual Value) are in the Q1 category. However, for example, the journal ranked 50th might have an IF value of 7.376, while the one ranked 51st might have an IF value of 7.374. The difference is extremely small, but the journal ranked 50th will be considered Q1, and the journal ranked 51st will be considered Q2. Although there is no significant difference in IF values between the two journals, the Q values they receive are enormously different. This situation has a high potential for creating disadvantages. For example, in Turkiye, to obtain the title of Associate Professor in the field of Natural Sciences, it is mandatory to obtain 40 points in journals categorized as WOS Q1, Q2, and Q3 [12] (Accessed: July 16, 2026). Here, a publication in a Q1 journal receives 30 points, while a publication in a Q2 journal receives 20 points. The difference is quite large. To somewhat prevent similar injustices, WOS started giving IF values as single digits after the decimal point (e.g., 4.3) after 2023. We do not know whether WOS took into account the situation in Asan and Aslan's [11] study when making this decision. However, the decision was correct. Because, as in this example, after this decision, the difference in IF values between journals Q1 and Q2 will be around 1/10, not 1/1000. This decision also led to other consequences. Because IF values only have one digit after the decimal point, it is now possible for two different journals to have the same IF value. When two journals have the same IF value, one cannot be designated Q1 and the other Q2. How can this be done? Their IF values must be the same. Therefore, journals in the same category with the same IF value have started to receive similar Q values. In fact, this situation has slightly changed the situation where journals in the top 25% in the same field become Q1. Because out of 200 journals in the same field, those in the top 25%, i.e., the first 50 journals, become Q1, but if the 50th and 51st journals have the same IF values, then not the first 50 journals, but the first 51 journals become Q1. This causes a change in the top 25%. In this case, we are now talking about the 25.5% percentile, not the 25% percentile. For example, Circulation and Progress In Energy and Combustion Science have the same WOS 2025 IF value: 41.3. These two journals publish in different fields. However, Computer Science Review and Information Fusion, which are in the field of

Computer science, theory & methods, also have the same WOS 2025 IF value: 17.4. Therefore, they will receive similar Q values.

Another issue regarding journal IF values is the difference between the highest and lowest Q1 values received by journals in a field that are classified as Q1 [11]. For example, if there are 200 journals in a field, the top 50 journals in terms of IF value will be Q1. However, the IF value of the journal ranked first will definitely not be the same as the IF value of the journal ranked 50th. For example, the IF value of the journal ranked 1st might be 18.2, while the IF value of the journal ranked 50th might be 9.7. Although there is a large difference in IF value between the two journals, both are in the Q1 category, and researchers who have publications in these two journals receive the same score. However, the quality of these two journals in terms of IF value is very different.

The IF value of a journal is related to the number of citations received by the works published in that journal. However, there is no homogeneity involved. Because not every work published in a journal receives the same number of citations, and the contribution of each work to citations is not equal. For example, let's say a journal published a total of 120 articles in 2023 and 2024. The number of citations these 120 articles received in 2025 (e.g., 360 citations) is divided by 120 to find the journal's IF value for 2025 (360/120 = 3). However, not all of these 120 articles receive the same number of citations. For example, 50 of the 120 articles may receive no citations at all, and only the remaining 70 articles may receive citations. Moreover, the citations received by these 70 articles do not show a homogeneous distribution. So, out of 360 citations, 300 might belong to just one article, while the remaining 60 citations might belong to 69 articles. However, when calculating the IF value, the 360 citations are divided among the 120 articles in total, not among the 70 contributing articles. This constitutes the weakest aspect of the IF value calculation. Therefore, scientific journal editors tend to reject draft articles that have no potential for receiving citations. According to Smith [13], in Nature, 25% of publications in a year received 89% of the citations; one article received 1000 citations while another received only 20. All these situations necessitate thorough citation analysis. According to Smith [13], the IF value varies greatly between disciplines; journals in molecular biology, cell biology, and immunology generally have high IF values, while journals in surgical sciences may have lower IF values. Again, according to Smith [13], US journals generally dominate the database (according to WOS 2026 data, approximately 33.74% of journals included in WOS SCI-Exp., SSCI, and AHCI are of US origin), and US authors tend to cite works published in US journals. 72% (71.72%) of the journals indexed in SCI-Exp., SSCI, and AHCI originate from four countries (June 3, 2026): USA: 4595 journals (33.74%), UK: 3280 journals (24.09%), Netherlands: 1031 journals (7.57%), Germany: 861 journals (6.32%) (four countries: 9767/13618 journals). 28.28% of the journals are distributed across countries other than these four, meaning the distribution is not homogeneous. It is impossible for each country to be represented by an equal number of journals, but the concentration of 72% of the journals in these four countries is also disproportionate. In ESCI, the proportion of journals originating from these four countries is 40.41% (3781/9356) [14]; because journals in ESCI are mostly regional journals and generally tend to be selected from outside these four countries. The number of journals publishing in languages other than English and the number of journals from less developed countries included in the WOS journal list are low.

Since the impact factor is generally considered an indicator of research quality, some journals adopt publication policies and practices (some acceptable, others questionable in purpose) to increase their impact factors [15, 16]. For example, journal management may advise authors of accepted articles to "refer to articles previously published in our journal." If the author heeds this advice, the journal may receive more citations, but this could increase the journal's self-citation rate, so caution is advised. Depending on the field, a self-citation rate of 12-20% is generally considered acceptable in a journal. Excessive self-citation in a journal may lead to its removal from the WOS database. Furthermore, articles in some fields may only start receiving citations after more than three years, whereas IF calculations only consider the last two years. For example, an article published in Acta Mathematicae Applicatae

Sinica-English Series in 2010 (26/4: 633-642) received no citations in the four years between 2010 and 2013 (WOS database, 17.7.2026), but it started receiving citations from 2014 onwards, reaching 24 citations by 17.7.2026. This is normal for the field of mathematics. However, considering WOS IF calculations, the journal's IF value appears very low. Yet, this low value stems from the nature of the journal's field of publication, not from the journal itself. Similarly, in some fields of arts and humanities, it may take longer for the number of citations to reach a certain value. In contrast, in life sciences, citations can reach their highest level after only a few years. In other words, the rate of increase in citations is slower in fields such as social sciences and arts, but faster in science fields.

Articles on methods can also sometimes receive a large number of citations (but it is quite difficult to generalize this situation). For example, the article “Lowry et al. J. Biol. Chem. 1951, 193 (1): 265-275”, published in 1951, has received 368,191 citations in all WOS databases as of 17.7.2026 (and 359,291 citations in the main WOS collection alone) (WOS, 17.7.2026). This is the most cited article in this journal, which has been indexed by WOS since 1905, up to 17.7.2026; the second most cited article has 65,668 citations. There is a significant difference between the second and the first.

Furthermore, it is difficult to state that every article that receives a citation is cited in a positive or laudatory manner. Some articles may be cited because they have received criticism. In addition, when calculating WOS IF values, only citations in the WOS database are considered; citations in publications not indexed by the WOS database, such as journals, books, book chapters, conference proceedings, textbooks, manuals, encyclopedias, project reports, theses, official reports, popular journals, and company reports, etc., are excluded. The WOS database employs an editorial process when selecting journals, books, and conference papers [17] and cannot encompass every publication worldwide. However, this does not provide a completely accurate and precise overview of the citations a work receives. However, this is a debatable point. Citations in journals, books, and conference proceedings that are not indexed by WOS cannot appear in the WOS system. This is because, as mentioned above, WOS has criteria for including and indexing journals, books, and conference proceedings.

Furthermore, the IF value is relative; for example, an IF value of two for a journal in the field of microbiology is not very impactful, but it is impactful in mathematics. For instance, although AIMS Mathematics has an IF value of 1.8 for 2025, the journal is ranked in Q1. However, even though the Journal of Basic Microbiology has an IF of 3.3 for 2025, it is classified as a Q3 journal. This is because the field of microbiology encompasses many disciplines-such as medicine, dentistry, veterinary medicine, agriculture, biology, nutrition and dietetics, food engineering, and aquaculture-and an article in this field may receive citations from various other disciplines. Nevertheless, some publishers may use a high IF value for promotional purposes. Additionally, works published in certain journals that are not indexed by various reports and databases in many scientific disciplines may still be significant, but they are not included in IF calculations. Seglen [18] noted that the IF value has various limitations and highlighted four main limitations. Additionally, the IF value cannot be calculated until at least three years have passed since a new journal began publication. For this reason, the IF value is not-and should not be-the sole criterion for selecting a journal. Furthermore, the number of journals in each category within the WOS is not equal. For example, as of July 28, 2026: There are 33 journals in the Mycology category, 285 in Plant Sciences, 207 in Cell Biology, 328 in Biochemistry, 92 in Forestry, 99 in Dermatology, and 333 in the field of cancer [14]. This situation affects the Q values of journals for each category.

There are also universities that oppose academic evaluations based on these types of numerical values. For example, University of Utrecht (The Netherlands), September 8, 2025: “The use of journal impact factors is not in line with our vision of Open Science. At UU, we recognize and reward research and researchers based on the quality of their work, not on the impact factor of the journal in which they publish or the number of publications and citations” [19]. Naturally, this decision is open to debate.

The Relationship Between the IF and the h-Index

The h-index was developed by Hirsch [20]. Although originally designed to evaluate physicists, the h-index has been adopted by various disciplines-including medicine-due to its simplicity; however, it has sparked debates regarding its fairness, comprehensiveness, and unintended consequences. Although the h-index has become a useful criterion for academic promotions, grant allocations, and institutional rankings, what is important is that it offers a middle ground by preventing an excessive emphasis on a few highly cited articles or on publication numbers alone [21].

The h-index is primarily used to measure the scientific performance of researchers; it focuses on the articles published in a journal rather than the journal itself and examines the number of citations a publication receives. Databases such as Scopus, WOS, and Google Scholar publish data using this index. The h-index can be used to measure not only the scientific output of individuals but also that of a journal, an institution, or a country. However, the h-index is used primarily to measure the citation status of researchers' publications rather than that of journals, institutions, or countries. In other words, the h-index is a concept related to the citations received by a person's publications. For example, if a person's h-index is 12, this means that each of their 12 publications has received at least 12 citations individually. In other words, the h-index value cannot exceed the number of publications the person has. It is important that all 12 publications-not just one-have received citations. For example, if only one of this person's 12 publications had received 25 citations while the others received none, their h-index would be one. If that single publication had received 550 citations instead of 25, the h-index value would still be one.

The IF and h-index metrics are entirely based on citations received. However, there are significant differences between them. In IF calculations, the fact that a publication receives many citations in the year under consideration is based on the assumption that these citations are distributed equally across the journal's articles. For example, if 100 articles were published in a journal during the year of calculation and only 35 of these 100 articles received a high number of citations, these citations are distributed equally among all 100 articles-not just the 35-and the journal's IF value is calculated. However, since publications that do not receive citations increase the number in the denominator, the resulting number is smaller-meaning the IF value may decrease. For example, if these 35 articles received 600 citations in the year of calculation, the number 600 is divided by the total number of articles (100), not by 35: 600/100 = 6. The IF value is six. However, if the number were divided only by the number of cited articles, the result would be 600/35 = 17.1. In other words, the IF would be 17.1. There is a 2.85-fold difference between the two. However, the h-index does not work this way. In the h-index, it is not just the fact that one or two papers receive many citations that matters; rather, it is important that each paper individually receives many citations. For example, if a researcher has 50 articles but only 20 of them have each received at least 20 citations, that person's h-index value would be 20. The other 30 articles, which have not reached 20+ citations, are not taken into account in the calculation. A researcher with 50 articles can have a maximum h-index of 50; in other words, the h-index cannot exceed the number of publications. This situation presents a disadvantage for researchers who are just starting out and have few publications, causing their h-index to remain low for some time. In other words, the h-index is more meaningful for those who have been conducting research and publishing for a long time, rather than for those just starting out.

Furthermore, as a person's h-index increases, the works that receive fewer citations than the h-index value must receive more citations in order to be included in the h-index calculation. For example, let's consider two individuals: Person A and Person B. Let Person A's h-index be 80, and Person B's h-index be 20. For Person A's h-index to be 81, the 81st paper must receive at least 81 citations, and each of the other 80 papers must also receive at least 81 citations. In contrast, for Person B's h-index to be 21, the 21st paper must receive at least 21 citations, and each of the other 20 papers must also receive at least 21 citations. The number of citations required for Persons A

Table 1. Journals ranked in the top 10 on the WOS journal list based on 2025 IF values.

Journal	IF	h index	Number of titles	The year it was first indexed in WOS	Source
CA-A Cancer Journal for Clinicians	685.2	238	2080	1974 (First published: 1950) (https://acsjournals.onlinelibrary.wiley.com/journal/15424863)	WOS
Nature Reviews Molecular Cell Biology	118.0	563	4323	2000 (First published: 2000)	WOS
Lancet	109.0	1194	259733	Before 1960* (First published: 1823) (https://www.thelancet.com/)	WOS, journalmetrics.org/journal/lancet
Nature Reviews Microbiology	104.6	425	3740	2003 (First published: 2003)	WOS
MMWR Surveillance Summaries	96.9	70	147	2014 (First published: 1952 (https://www.cdc.gov/mmwr/mmwr_ss/ss_pvol.html)	WOS
Nature Reviews Clinical Oncology	94.6	258	2377	2009 (First published: 2004) (https://en.wikipedia.org/wiki/Nature_Reviews_Clinical_Oncology)	WOS
Nature Reviews Drug Discovery	91.2	431	5915	2002 (First published: 2002)	WOS
New England Journal of Medicine	84.5	1275	118179	Before 1989* (First published: 1819) (https://www.nejm.org/loi/nejm/group/d1810.y1819)	WOS, https://journalsearches.com/journal.php?title=new%20england%20journal%20of%20medicine
Nature Reviews Materials	83.3	266	1154	2016 (First published: 2016)	WOS
Signal Transduction and Targeted Therapy	81.2	254	2851	2016 (First published: 2016)	WOS

* When journal content appears in WOS, a maximum of 100,000 records can be viewed. Since it is not possible to go further back, it has not been possible to determine exactly when the journal was first indexed by WOS.

and B to increase their h-index values by just one differs significantly. This situation does not seem very fair. When calculating the h-index, the number of authors on a paper is not taken into account. However, the contributions of each author on a paper are not of equal quality, yet the h-index value is divided equally among all authors. While the h-index is useful, it is evident that it has various limitations.

When comparing the IF and h-index values of journals, different results may emerge (Table 1). When the IF value is considered, CA-A Cancer Journal for Clinicians ranks first, whereas when the h-index value is considered, the New England Journal of Medicine ranks first. Braun et al. [22] also conducted a similar comparison, and according to their study, Nature ranked first in terms of the h-index but 10th in terms of the IF; Science ranked second in terms of the h-index but 13th in terms of the IF; and New Eng. J. Med. ranks third or fourth in terms of h-index but 5th in terms of impact factor. There are reasons for this difference. While IF calculations always consider the last three years, there is no such limitation in h-index calculations; the older the journal's indexing history by WOS, the higher the h-index value may be.

Conclusion

Rull [23] addressed issues related to the use of the h-index and noted that, although this index remains the most common metric for measuring individual performance, it encourages self-citation, ghost authorship, and the misallocation of contribution shares; he proposed the C-score index, which is adjusted to account for self-citations; thereby normalizing citation counts (hm-index). Rull [23] argued that this proposal helps measure each researcher's impact more realistically after excluding self-citations and should be used in the evaluation of individual researchers. Chandra et al. [21] also noted that while the h-index is a valuable indicator of scientific impact, it should not be used as the sole parameter in academic evaluation; they argued that institutions, journals, and funding agencies should collaborate to transform the metrics-driven academic model into one that values innovation, quality, and integrity.

Despite its strengths, the h-index is far from being a perfect tool. It is particularly field-dependent, and because of differences in citation patterns across disciplines, it makes comparisons between different fields inappropriate. The h-index does not distinguish between positive and negative citations; it does not account for publications that have been retracted or are erroneous but are still cited, nor does it take into account the author's position and contribution-a significant factor in clinical research involving multi-authored articles [21].

h-index values are published by WOS, Scopus, and Google Scholar. However, the h-index values for the same person or institution may vary across these three databases. For example, Person A's h-index value might be 27 in WOS, 32 in Scopus, and 42 in Google Scholar. Even for the same person, h-index values can vary. There are several possible reasons for this: The source of citations to the works of an individual or institution is important. While citations from journals are prioritized in WOS and Scopus, this is not the case in Google Scholar, which considers every citation obtained online. For this reason, h-index values in Google Scholar are generally higher than those in WOS and Scopus. Additionally, the journal collections of WOS and Scopus are not equal [WOS (SCI-Exp., SSCI, AHCI, ESCI): 22,997 journals; Scopus: 30,200 journals (July 29, 2026)]. As the number of journals in a database increases, the number of citations received will naturally increase, and both the h-index and IF values will rise.

The IF and other similar indices, such as the h-index, play an important role in the scientific evaluation of institutions and researchers. These indexes are used in many decisions, such as institutional rankings, departmental rankings, faculty recruitment and promotion evaluations, and the selection of various awards. While many experts argue that these indices should play only a limited role in such applications, reliance on them is steadily increasing [21].

There have also been objections to this from various organizations. For example, the San Francisco Declaration on Research Assessment (DORA) is a statement condemning the practice of linking a journal's impact factor to the value of a specific researcher's contributions. It was introduced during the annual meeting of the American Society for Cell Biology (ASCB) held in San Francisco in December 2012. The declaration argues that the quality of individual research articles cannot be accurately assessed based on the citation performance or prestige of the journal in which the article is published. According to this declaration, the use of the impact factor leads to biases and inaccuracies in the evaluation of scientific research. The statement also noted that the impact factor should not be used as a substitute "for measuring the quality of individual research articles or in decisions regarding hiring, promotion, or funding" [24; 25].

Despite all these debates, the IF, journal Q-values, and h-index remain important metrics for journals, researchers, and scientific institutions. At present, there are no new metrics that can replace these and meet all expectations. Another important point regarding IF and h-index metrics is this: When using the IF, the criticisms raised must also be taken into account, and these values should be used with caution. Analytical concepts such as the IF, h-index, and Q-value highlight the quantitative aspect of publications, as the data is expressed numerically. Alongside all of this, quality must also be emphasized. For example, when awarding a prestigious academic prize to a scholar, rather than focusing on questions such as in which journals (Q1, Q2, Q3, or Q4) their works were published or what their IF and h-index values are, the questions "Why does this scholar deserve this award?" and "What contributions have they made to science?" should be considered.

Researcher ranking indices-such as the number of publications and citations, co-authors, and the h-index-are used to assess a researcher's impact. Although the h-index is considered the primary indicator of research impact, its limitations have led to the development of alternative variants. However, there is no consensus within the academic community regarding the most effective ranking index. Assessing a researcher's scientific impact is important, but it is a complex process. To date, over 70 evaluation parameters have been proposed for ranking researchers. These parameters assess impact using both quantitative

and qualitative criteria; some of them employ mixed approaches [26]. Researchers in countries where English is the native language tend to cite articles written in English. However, articles published in languages that are widely used today can now be easily translated into the desired language using translation software.

Publishing hundreds of articles that make no scientific contribution is meaningless; it is more meaningful to produce fewer publications that do contribute to science. Although there are some limitations and issues with the use of analytical metrics such as impact factors (IF), journal Q-values, and h-indexes, their use by researchers and scientific institutions is steadily increasing. For example, citations to works may be inflated by some researchers, and a pattern of mutual citation among researchers may develop; all of these manipulative behaviors affect the Impact Factor, h-index, and journal Q-values, potentially leading to different results. Although it is not possible to completely abandon these analytical metrics, their use can be restricted, and their reliance as the sole criterion in academic promotions, the distribution of academic awards, and similar contexts can be reduced. One of the most important criteria to consider should be quality, and measures of quality should be used in conjunction with these analytical metrics.

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