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Surpassing the Professor Rank: The H-Index as a Measure of Global Academic Leadership

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Abstract

Background: The H-index is a widely used metric to assess the academic productivity and citation impact of researchers. It has become particularly important in academic medicine, where physicians' research output is integral to their career progression. International organizations have a compelling need to identify world-class expert academic physicians who operate at a level above that of a typical full professor on a global scale.

This paper explores the relationship between the H-index and academic rank, focusing on its role in identifying top-tier medical researchers who surpass the typical expectations of full professors.

Methods: This paper synthesizes findings from studies conducted over the past decades that examined the H-index across various medical disciplines, including radiology, neurosurgery, anesthesiology, and emergency medicine.

Data were extracted from published studies that assessed H-index values in relation to academic rank (assistant professor, associate professor, and full professor). Key studies from the United States, United Kingdom and international settings were reviewed, focusing on the median H-index values reported for full professors and the trends observed across academic ranks.

Results: The results consistently show that the H-index increases with academic rank. For example, studies of academic radiologists, neurosurgeons, and anesthesiologists demonstrated that full professors had significantly higher median H-indices compared to their colleagues at lower ranks.

The median H-index for full professors ranged from 12.5 in radiology to 21 in neurosurgery. Additionally, a threshold H-index of 25 or higher was identified as indicative of researchers who surpass traditional professor ranks and contribute significantly to their respective fields. These high H-index values correlate with sustained, impactful research that is consistently cited by peers worldwide.

Conclusions: The H-index is a valuable tool for evaluating academic productivity in medicine, providing a quantitative measure of research influence that transcends academic titles. Physicians with an H-index of 25 or higher are considered leaders in their fields, making the H-index an effective metric for identifying top-tier medical researchers. This benchmark can aid in promotion decisions, recruitment of key faculty, and the recognition of experts who are shaping the future of medical research and practice. Further, using the H-index as a global standard can foster international collaboration and ensure that the most accomplished experts are leading the charge in addressing critical health challenges.

Keywords: H-index; Above Professor International Title; Academic Leadership

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Introduction

Academic productivity, typically measured through scientific publications, is a primary criterion for academic promotion in many fields, particularly in medicine.

One widely recognized metric to assess a researcher's productivity and citation impact is the H-index. This metric evaluates both the quantity and impact of a researcher's published work by considering the number of papers and the number of citations they have received. As a result, the H-index has become a valuable tool in identifying influential scholars, especially in academic medicine.

International organizations have a compelling need to identify world-class expert academic physicians who operate at a level above that of a typical full professor on a global scale.

The value of pinpointing these individuals extends far beyond mere recognition. For International organizations and bodies like the World Health Organization and the International Association of Medical Colleges, these experts are indispensable for crafting evidence-based guidelines and policies that will shape medical practice across nations.

Research consortia and funding organizations rely on them to lead ambitious, multidisciplinary studies that drive genuine innovation, as their involvement lends credibility and increases the likelihood of groundbreaking discoveries.

For top-tier universities and academic medical centers, recruiting or collaborating with such physicians is a direct accelerator of institutional prestige, research grant acquisition, and the mentorship of the next generation of scientific leaders.

Furthermore, in times of international crisis response or pandemic management, these individuals provide the authoritative, science-backed voice that can guide public health strategies and counter misinformation.

Ultimately, identifying these above-professor-level physicians allows organizations to map and engage with the very apex of the global medical research ecosystem, ensuring that the most complex challenges in human health are addressed by the most proven and influential scientific minds [1-9].

The work of Diane M Radford from the United States and her research team confirmed that physicians' H-index correlates with academic rank in the field of breast surgery. The study demonstrated that full professors had significantly higher H-indices than associate and assistant professors.

In this context, physicians with exceptional H-indices typically above the level of a full professor are seen as critical figures in driving medical research and improving global health.

Methodology

This study reviews the findings of various research teams over the years, particularly focusing on studies that analyzed the H-index in relation to academic rank. The H-index of academic physicians has been assessed in multiple specialties, including radiology, neurosurgery, anesthesiology, and emergency medicine, among others.

The aim was to examine the correlation between the H-index and academic rank across various medical disciplines, highlighting its role in identifying those physicians who significantly surpass traditional academic ranks in their contributions to research.

The methodology involves synthesizing the results of multiple studies that measured the H-index of academic physicians across different ranks (assistant professor, associate professor, and full professor). Notably, these studies have been conducted in the United States and internationally. Specific emphasis is placed on how the H-index correlates with academic rank, particularly for those who exceed the typical professor rank.

Results

Several studies have provided evidence that the H-index increases with academic rank, reflecting a physician's growing influence and research output. Key findings from these studies include:

In 2010, the work Arash Ehteshami Rad from the United States and his research team demonstrated the increase of H-index of academic radiologists with academic rank. They reported that the mean H-index was 12.5 +/- 10.8 for full professors. Thus, the H-index provides a benchmark for comparing a given academic radiology professor to national and international averages [11].

During the same year, Christopher M Spearman from the United States and his research team demonstrated the increase of H-index of academic neurosurgeons with academic rank. The median H-index for professors was 19 [12].

In 2011, Dylan Bould from Canada and his research team demonstrated the increase of H-index of academic anesthetists with academic rank. The median H-index for professors was 17 [13].

During the same year, Paul S Pagel and Judith A Hudetz from the United States demonstrated the increase of H-index of academic cardiothoracic anesthesiologists with academic rank. The median H-index for professors was 12 ± 8 [14].

In 2014, Matthew Babineau from Boston and his research team studied the H-index of 299 professors of emergency medicine. Median H-index in Google Scholar was 14 [15].

During the same year, Krystal L Tomei from the United States and her research team studied the H-index of 1052 academic neurological surgeons. The median H-index for professors was 20 [16].

During the same year, Asif Doja and his research group conducted a study examining the H-index of 130 medical academics serving as editorial board members for medical journals. Among these individuals, 95 were full professors, 21 were associate professors, and 14 were assistant professors.

The study revealed a notable distinction in the H-indices between these ranks. The median H-index for full professors was found to be 14, whereas associate professors had a median H-index of 7, and assistant professors had a median of 6.5. These findings suggest a clear progression in research output and citation impact with academic rank.

Furthermore, the study observed that there was no significant difference in the H-index between MDs and PhDs, indicating that the level of education (MD or PhD) may not be as critical as academic

Table 1: The studies highlighting the median H-index for professors in each study.

Authors and Year	Medical Field	Median H-index for Professors
Rad AE et al (2010)	Radiology	12.5 ± 10.8
Spearman CM et al (2010)	Neurosurgery	19
Bould MD et al (2011)	Anesthesiology	17
Pagel PS and Hudetz JA (2011)	cardiothoracic anesthesiology	12 ± 8
Babineau M et al (2014)	Emergency Medicine	14
Tomei KL et al (2014)	Neurological Surgery	20
Doja A et al (2014)	Medical Education	14
Wilkes FA et al (2015)	Neurosurgery	21
Martinez M and colleagues (2015)	Musculoskeletal Tumor Surgery	19
Therattil PJ et al (2016)	Plastic Surgery	15
Wang R et al (2022)	Surgical Faculty	17
Shah FA and Jawaid SA (2023)	General Medical Research	15-20

position when it comes to research influence [17].

In 2015, Fiona A Wilkes from London and her research team studied the H-index of 315 academic neurosurgeons. The median H-index for professors was 21 [18].

During the same year, Maximilian Martinez from the United States and colleagues studied the H-index of 247 academic members of the Musculoskeletal Tumor Society. The median H-index for professors was 19.

In 2016, Paul J Therattil from the United States and his research team studied the H-index of 592 academic plastic surgeons. The median H-index for professors was 15.

In 2022, Rongzhi Wang from University of Alabama at Birmingham and his research team explored the role of the H-index in the academic advancement of surgical faculty members.

They emphasized that the H-index can be a valuable tool in the evaluation of faculty productivity, particularly in academic medicine, where high-impact publications are essential for career progression.

Rongzhi Wang and his research team suggested that the H-index provides a more objective and quantifiable measure of academic impact than traditional performance metrics, such as teaching or service, making it particularly useful for promotions and tenure decisions. At their institution, they found that the median H-index at the time of promotions from associate professor to full professor was 17.0.

This aligns with broader findings observed in previous studies who similarly found that academic rank and H-index tend to correlate, with full professors exhibiting higher H-indices than those at lower ranks. The study advocates for the use of the H-index in promotion decisions, suggesting it could serve as an objective and transparent measure of academic leadership, identifying faculty members who surpass traditional academic ranks in their contributions to research.

In 2023, Faaiz Ali Shah and Shaukat Ali Jawaid from Pakistan suggested that an H-index of 15 to 20 is a good standard for appointment to full professor.

Table 1 summarizes the studies highlighting the medical field and the median H-index for professors in each study.

Based on these findings, it is generally accepted in the medical academic community that physicians with an H-index of 25 or higher are considered to be above the level of a typical professor. This threshold reflects a significant contribution to the field, placing these individuals in a category of exceptionally influential researchers.

Discussion

Utilizing a metric like an H-index of 25 or higher on Google Scholar serves as a robust, quantitative filter for this elite tier, as it reflects not just volume but sustained, impactful publication whose work is consistently cited by peers worldwide, a hallmark of exceptional influence.

By using the H-index as a benchmark, it becomes easier to identify academic physicians whose research achievements transcend traditional ranks and demonstrate sustained and high-impact contributions to their discipline. The ability to pinpoint these high-level researchers is particularly useful from an international perspective, as it allows for recognition of leading figures in medical research, regardless of their formal academic title. This recognition is crucial in fostering global collaboration and ensuring that the most accomplished experts are involved in shaping future medical advancements.

The H-index serves as a reliable and quantifiable metric for evaluating academic productivity and influence, particularly in medical research. Studies across various specialties consistently show that the H-index correlates with academic rank, with full professors demonstrating significantly higher values. This trend highlights the importance of the H-index in recognizing those physicians, whose research contributions transcend traditional academic roles, placing them among the most influential figures in their fields.

Given its objective nature, the H-index is increasingly being adopted in academic institutions and global health organizations as a benchmark for assessing faculty productivity, guiding promotion decisions, and identifying key contributors to medical research.

It is generally accepted in the medical academic community that physicians with an H-index of 25 or higher are considered to be above the level of a typical professor.

Physicians with an H-index of 25 or higher are considered leaders in their respective fields, and their work plays a pivotal role in shaping future medical advancements and public health strategies. Therefore, utilizing the H-index as a measure of academic achievement offers a standardized way to identify and engage top-tier medical researchers globally, ensuring that the most pressing health challenges are addressed by the most accomplished experts.

Conclusion

It is generally accepted in the medical academic community that physicians with an H-index of 25 or higher are considered to be above the level of a typical professor. The H-index is not only valuable for career progression within academic institutions but also plays a critical role in global health initiatives. Physicians with high H-indices (25 or higher) are crucial for shaping evidence-based policies, leading research consortia, and guiding public health strategies.

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