

Unravelling the evolution of medical scientific publishing to hold the promise of science for better patient care

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In the dynamic realm of academia, where scientific publications shape the future, it is crucial for stakeholders to explore the forces driving disruptive changes. These include researchers, reviewers, editors, publishers, funding bodies, and, most importantly, readers. In medicine, science should ultimately strive to serve readers. Advancing academic medicine requires the necessary exercise to balance the need for trustworthy science (studies that improve on value for patients, physicians, and healthcare systems) and the ever-changing landscape of academic publishing with existential flexibility.

Undoubtedly, a multifaceted interplay of factors discussed herein has (re)shaped the evolution of scientific publishing.

1. The evolving transformation (crisis) of clinician scientists' role and mission.

Clinician scientists fulfil an essential dual role in the advancement of academic medicine. They can drive meaningful changes in patient care by supporting high-quality research, evidence-based medicine, guideline adherence, patient empowerment, and value-based healthcare reforms. Yet, the mission to bridge the gap between academia and clinical practice is becoming complex, and clinician scientists demand increasing support for navigating the challenges of real-world medical practice.

2 The innovative strategies pursued by the scientific community to deliver the research contents generated by scientists in response to changing attitudes and requests from the public.

Graphical abstracts, podcasts, and other multimedia formats have experienced a wider diffusion within the scientific community based on a more accessible, 'cost-effective' way of disseminating scientific content to busier readers with less protected time to 'digest' them. In this setting, social media has emerged as a powerful tool for scientific dissemination, offering researchers an unprecedented reach to diverse

stakeholders. However, such a paradigm shift in delivering science requires judicious navigation between time efficiency and credibility [1].

Subsequently, the traditional metrics upon which scientists and journals are currently being judged (e.g., the h-index, number of publications, and impact factor) are becoming outdated as static measures of a dynamic process. This leads to a shift toward alternative metrics that better represent the digital era, such as Altmetrics, likes, shares, views, and download counts. While potentially more reliable in measuring the impact, their ability to convey clinically sound and/or practice-changing messages from high-quality research to the public is controversial. In this scenario, where the traditional metrics may no longer be the 'gold standard' for evaluating researchers, the academic community must engage in a broader conversation about meaningful and inclusive metrics that could capture the multifaceted contributions to scientific knowledge. Using alternative metrics may prevent young researchers—who are under pressure to meet the rigorous demands of academia—from leaving aside groundbreaking research and moving away from meaningful contributions to better patient care [2].

3 The democratisation of access to scientific knowledge.

Besides some pros, such an evolution of scientific publishing has raised concerns about the proliferation of predatory journals. Striking a balance between accessibility and quality is imperative to uphold the integrity of academic publishing. The conversation on integrity in scientific publishing should also include the potential threats that can derive from the indiscriminate use of artificial intelligence (AI) [2]. AI is poised to revolutionise the publishing process, from aiding researchers in writing papers to streamlining the demanding, time-consuming peer-review process to enhancing the precision of editorial decision-making [3]. Additionally, AI holds the potential to convert raw data and complex outputs into practical insights. By automating literature reviews and

clinical trial searches, clinicians can develop and analyse publications on intricate topics while staying updated on rapidly evolving documents in the field [4].

However, AI nowadays represents a promising opportunity for authors and editors to increase scientific creation, evaluation, and dissemination efficiency and accuracy. On the other hand, defining safe boundaries for AI applications will be paramount. The phenomenon of published paper retractions due to plagiarism, fake peer reviews, errors, and data falsification was reported years before the widespread diffusion of generative AI chatbots [5]. We cannot even imagine the potential (negative) impact of the unregulated use of generative AI on the likelihood of post-publication retractions. While the use of AI in specific fields of research will empower clinicians to reach unprecedented goals (e.g., leveraging the power of AI to analyse large amounts of information such as real-world evidence and big data, paving the way for evidence-based research grounded in real-world scenarios), defining the right horizon of what judicious use of AI potential can offer researchers, reviewers, editors will be a first key step toward safeguarding clinician scientists, academics, and patients.

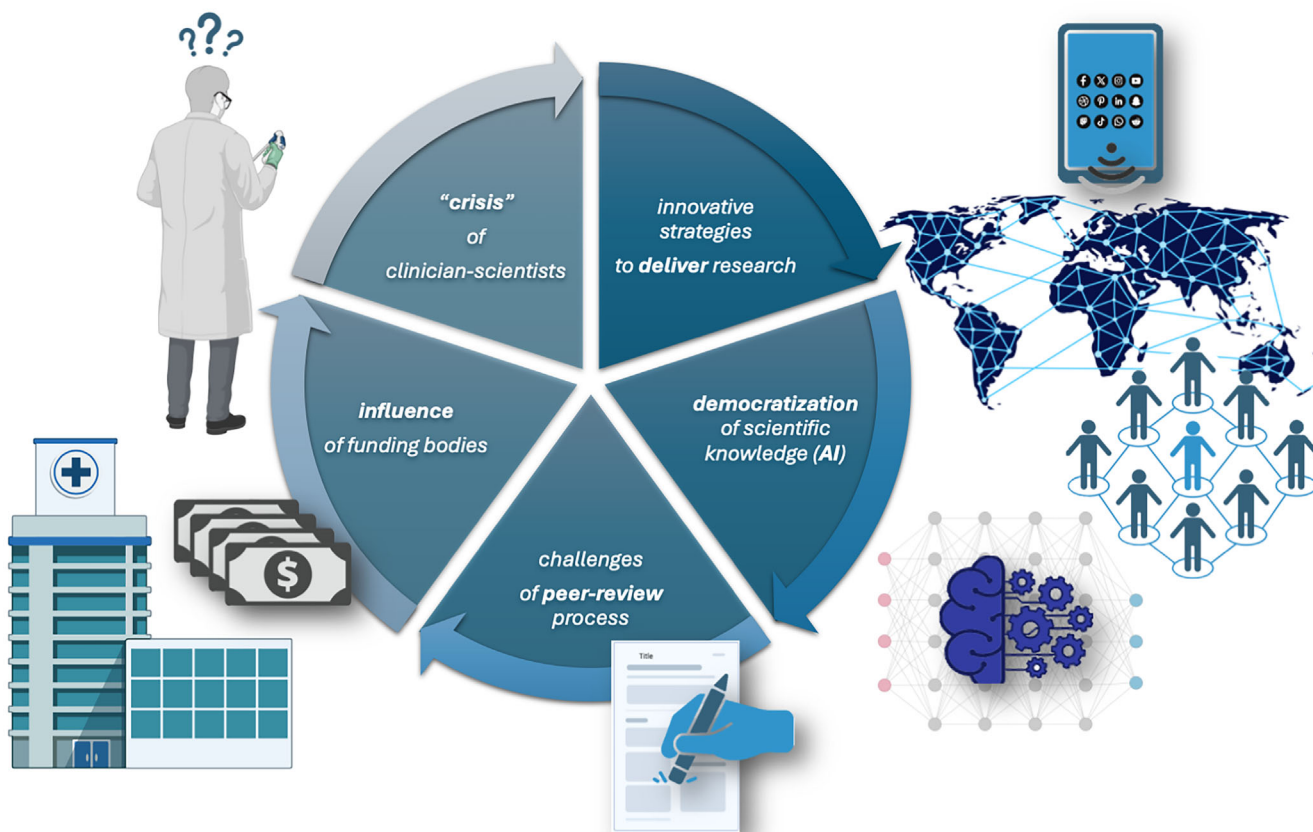
4 The ongoing challenges faced by the peer-review process.

In this regard, the decreasing pool of active, skilled reviewers is reshaping the framework through which scientific journals and editors evaluate the quality of submitted manuscripts and manage the review process. While likely influenced by a lack of compensation, limited financial incentives, and thrifty recognition of extremely selected individuals, this phenomenon threatens what has been praised for years as the prerequisite for the quality and integrity of published research [6].

5 The influence of funding bodies/organisations on published research.

Funding entities such as research institutes, non-profit associations, academic networks, pharmaceutical companies, etc., could reshape research priorities, influencing policymakers' and healthcare systems' agendas. Balancing financial support with research integrity will be crucial to ensure that the progress of scientific publishing will align with the mission of improving the value of healthcare outcomes. Given the close relationship between funding and access to publications (i.e., through open-access publication

Fig. 1 The multifaceted interplay of discussed factors that potentially will (re)shape the evolution of scientific publishing.



models), standardised reporting of the potential influence of funding bodies on the study concept, design, and publication process will aid editors, reviewers, and readers in data interpretation for research purposes and clinical practice [7].

The graphical summary of the interplay of discussed factors is represented in Fig. 1.

We believe the above-discussed themes related to the evolution of medical scientific publishing might eventually contribute to reshaping the concept of impactful science. Researchers should remember that research aims to improve patient care by leveraging the paradigm of evidence-based medicine. Robust pillars of academic publishing should consistently contribute to this goal.

The academic community must remain vigilant over the evolution of scientific publishing, emphasising the importance of shared rigorous methods to evaluate the quality and impact of science and to judge researchers and journals accordingly. These efforts should also promote honest and effective science communication to ensure that findings are accurately delivered to clinicians, researchers, and patients. Defending the essential value of scientific publishing, harmonising the perspective of those who create (authors), evaluate (reviewers), publish (journals/editors), and benefit (clinicians, researchers, patients, healthcare systems) from science, is a common responsibility that the academic community must embrace. Future efforts by the academic community should be focused on initiatives advocating for the authentic value of science, protecting its integrity, and supporting clinician–scientist missions during their academic path [8].

Disclosure of Interests

The authors have no conflict of interest.

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