Medicina Clínica xxx (xxxx) 107036

MEDICINA CLINICA

www.elsevier.es/medicinaclinica

Special article

Predatory journals: A serious risk for scientific publications

Las revistas depredadoras: un grave riesgo para las publicaciones científicas

Marta Pulido*

Editora Médica Independiente, Acreditada en Editing/Writing por la American Medical Writers Association, Profesora de Comunicación Científica, Máster en Biomedicina, Universitat de Barcelona, Barcelona, Spain

ARTICLE INFO

Article history:
Received 9 January 2025
Accepted 1 April 2025
Available online xxx

Introduction

So-called "predatory journals", also referred to as fraudulent, misleading, or pseudo-journals, are primarily open access publications that claim to be legitimate academic journals but are characterised by the misrepresentation of editorial practices typical of genuine scholarly publications. Chief among these is the false assertion that they operate a peer-review process. Other common predatory practices include concealing information about publication fees or article processing charges (APCs) and usage rights, manipulating the identities of the editorial board members, falsifying bibliometric indicators such as impact factor and database indexing, along with various other breaches of publication ethics and scientific integrity.

The proliferation of "predatory journals" constitutes an alarming phenomenon that directly undermines the integrity of academic publishing. With wide-reaching implications, these journals seriously erode the authenticity of research output. They compromise authorship credibility and jeopardise the reliability of the information disseminated through academic journals. Furthermore, they represent a substantial waste of financial resources allocated for the funding, conduct, and publication of research.

Historical background

The term “predatory journal” was coined in 2010 by Jeffrey Beall,[1] a librarian, information specialist, and associate professor at the University of Colorado in Denver (USA). In 2008, he began noticing a growing number of emails from newly launched journals requesting that he submit articles or join their editorial boards. “I was immediately fascinated because most of the emails contained numerous grammatical errors” is a direct quote attributed to Beall,[2] which led him to begin compiling a list of publishers and “predatory journals” (Scholarly Open Access), published on his personal blog. The purpose of the so-called “Beall’s List” was to document open-access publishers and scientific journals that failed to conduct genuine peer review, instead publishing virtually any article as long as the authors paid the open-access fee.

In the years that followed, “Beall’s List” (https://beallslist.net/) became a valuable and widely consulted resource within the scientific community. Beall’s contribution was in shedding light on the questionable practices of such journals, serving as a serious warning to researchers about the risks involved in choosing to submit their work to these types of publications. Throughout the 2010s, he published several articles describing the operational tactics of predatory publishers and journals, how to avoid them, and the resulting harm to researchers and science in general.[3,4]

Although Beall was thorough and applied multiple criteria[4] (Table 1) before listing a particular publisher or journal, by 2013 concerns and legal threats began to mount. Several powerful publishing groups claimed that being included on Beall’s List amounted to defamation, threatening legal action and substantial financial penalties if their names were not removed immediately. Due to the impact of the controversy and the increasing media attention surrounding these legal disputes, Beall voluntarily removed all content from the Scholarly Open Access website on 17 January 2017,[5] at which point the list included up to 1,155 questionable publishers and 1,294 problematic journals.

Nevertheless, the term “predatory journals”, which has for years been globally accepted within the realm of scientific publishing, remains a genuine hallmark of Jeffrey Beall’s work.

* Corresponding author.
E-mail address: mpulidomestre@gmail.com

Table 1
Main criteria established by Jeffrey Beall to identify predatory publishers (and journals).[4]

Editor and editorial board	• The person owning the publisher is identified as the editor of every journal published by the organisation • No individual is identified as editor or individuals as editorial board members • No scholarly information on the editor or editorial board members (e.g. institutional affiliation) • Evidence exists that the editor or editorial board members lack academic experience reasonably qualifying them to lead publishing in the journal's field • Two or more journals share duplicate editorial boards • Journals have an insufficient number of editorial board members (e.g., 2 or 3), editorial boards with fictitious names, appoint editorial board members without their consent, or include prominent scientists exempted from any contribution other than lending their names and/or photographs • Little or no geographic diversity among editorial board members, especially in journals claiming international scope or coverage
Integrity	• Journal name is inconsistent with its purpose • Journal name does not properly reflect its origin (e.g., named "Canadian" or "Swiss" when neither editor nor any member is related to those countries) • Claims in spam emails or on the website that the journal has a real impact factor when false or an invented measure, simulating an exaggerated international reputation • False claims that the journal is indexed in prestigious databases • Requesting authors to suggest reviewer names and using these without verifying authenticity, allowing authors to create fake reviewer identities to review their own articles
Poor editorial standards and practices	• Word-for-word copying of "instructions for authors" from other publishers • Insufficient contact information; generic domain email addresses (e.g., @gmail.com, @hotmail.com) • Journals have generic and unspecific titles to attract more articles and obtain more publication fee income • Use of spam emails (with grammatical mistakes) to solicit manuscripts • Websites with broken links and prominent linguistic errors • Improper use or absence of standard identifiers such as ISSN or DOI • Claims guaranteeing rapid publication and/or unusually fast peer review • Absence of adequate peer review • Journals blatantly copy or imitate titles of journals from other publishers • Little or no geographic diversity among authors, indicating the journal has become an easy outlet for authors from a particular country or region to gain academic publications

The open access movement

The emergence and persistence of so-called "predatory journals" cannot be understood without reference to the rise of the open access movement—a new publishing model advocating for unrestricted, free, permanent access to scholarly content via the internet. By the end of the last century, subscription costs for biomedical journals had risen dramatically due to the expansion of scientific knowledge and the proliferation of highly specialised publications. Library budgets became increasingly inadequate to cover the cost of subscriptions (including large, bundled packages offered by publishers) and to maintain an appropriate level of information access for users. Simply put, institutions no longer had the funds to access all relevant journals and were thus forced to make difficult decisions about which subscriptions to maintain, cancel, or initiate. Furthermore, the dissemination of scientific work was limited by paywalled journals, resulting in a poor return on investment for funding bodies in terms of public accessibility to the research they supported.

Around this time, the growing influence of the internet facilitated the emergence of freely distributed online journals. In 2000, the United States National Institutes of Health launched PubMed Central, an open access repository which now houses nearly six million articles. That same year, BioMed Central was founded in the United Kingdom, also embracing the open access philosophy. In 2001, the Budapest Open Access Initiative,[6] and in 2003, the Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities,[7] signed by over 500 scientific institutions, gave decisive momentum to the open access movement. It is important to note that the central objective of these strategies remains the promotion of open access to peer-reviewed scientific journals.

From 2002 onwards, several publishing groups—such as BioMed Central and the Public Library of Science (PLOS)—began launching open access journals whose primary funding mechanism was the Article Processing Charge (APC), paid by authors, institutions, sponsors, or via agreements with other organisations. APCs are payable upon acceptance of the manuscript and cover publication, production, and editorial management costs. The open access model improves the speed, efficiency, and effectiveness of research; fosters interdisciplinary collaboration; enhances visibility, use, and impact; promotes citation; and allows unrestricted benefit from scientific advances. Another key aspect of open access is facilitating reuse through licensing.[6]

The publication of work in open access journals is known as the "gold route" (gold open access), in which the final published article is made publicly and freely available immediately and permanently. Predatory journals exploit these advantages by mimicking the gold open access model, having rapidly multiplied into a lucrative business that charges publication fees without offering the safeguards of ethics, scholarly rigour, or authenticity. In short, predatory journals undermine the credibility of legitimate journals under the shadow of fraud. The web of plagiarism, paper mills (which also affect subscription-based journals),[8] misuse of artificial intelligence in scientific writing,[9] and predatory journals forms a conglomerate of bad practices that is exceedingly difficult to resolve.

It is worth noting, however, that predatory publishing is not an inherent consequence of open access, but rather a reflection of the current research system and the commercial logic it operates under. The pressure to publish may lead researchers to seek faster, easier alternatives that bypass the high standards and integrity requirements demanded by reputable academic journals.

Criteria for classifying a "predatory journal"

First and foremost, it is crucial not to confuse legitimate open access journals with so-called "predatory journals", as the latter differ from the former in poor editorial practices, particularly the absence of a peer review process.

Although the term "predatory" already implies the exploitative nature of such journals, which usurp the role of reputable academic publications for their own survival, there is no consensus regarding their defining criteria. A systematic review of 93 checklists for identifying potential "predatory journals", published in English, French or Portuguese across various databases and

Table 2
Key features of potential predatory journals.

Journal's coverage (scope) includes both biomedical and non-biomedical topics[a]
Website contains grammatical and spelling errors (possibly due to translation issues, as most journals are based in non-English-speaking countries)
Distorted or blurry images intended to falsify appearance or used without authorisation (e.g., of legitimate logos)
Solicitation of authors by invitation with guaranteed rapid publication and promotion of certain bibliometric indicators, whereas legitimate journals attract authors through descriptions of scope, aims, and content in the "about the journal" section
Promotion of the Copernicus Value Index (ICV) on their website
Lack of description of manuscript management process
Manuscripts requested by email, unlike legitimate journals using platforms such as Editorial Manager®
Promise of rapid publication
No information on retraction policy
No information on whether the journal content will be digitally preserved or how this will be done
Article processing charges (APCs) unusually low
Copyright information is confusing or absent
Contact email has a public domain

APCs: article processing charges.
[a] There are legitimate open access mega-journals with broad coverage across different disciplines (e.g., Scientific Reports, PLOS ONE).

electronic platforms between 2002 and 2019, revealed significant discrepancies among them.[10] The most notable differences concerned the number of items or questions included in six thematic categories, such as journal operations, assessment of the quality of previously published articles, editorial and peer-review processes, communication with authors, transparency about publication fees, and indexing databases. In fact, none of the reviewed checklists was deemed optimal.

A "predatory score" has also been proposed, assigning points ranging from 0 to 2 across various criteria.[11] Although this method appears to have limited practical utility, certain indicators remain useful, such as the presence of a generic or absent editorial email address, editorial board members from a single country or with no listed affiliations, fewer than five individuals on the editorial board, lack of clarity regarding the review process, and peer review times shorter than one week.[11]

A cross-sectional study comparing the characteristics of 93 "predatory journals", 99 legitimate open access journals, and 100 subscription-based journals identified 13 distinctive features of potential "predatory journals" (see Table 2).[12] One noteworthy element is the promotion of journals through the Copernicus Value Index (ICV) by Index Copernicus International (https://journals.indexcopernicus.com/), despite ongoing debates about the credibility of this bibliometric indicator.[13] Additionally, the article processing charges (APCs) demanded by these journals are often considerably lower than those of legitimate open access journals—a tactic aimed at attracting as many submissions as possible.

In legitimate open access journals, copyright is not transferred to the journal or publisher but remains with the authors under licences that define permissible uses of the original work (commercial or non-commercial) and derivative works (e.g., translations, adaptations). However, there is a notable lack of uniformity in how publishers present information about their copyright and licensing policies to end users, making it difficult for authors and institutions to understand their rights.[14] Predatory journals typically provide no such information.

Further differences between predatory and legitimate open access journals are outlined in various articles.[15–19] These are summarised in Table 3. Nonetheless, while certain warning signs are easily recognisable, there is still no universally accepted "gold standard" for defining a journal as predatory.

A general approach might consider the following characteristics: (1) Open access journals with low barriers to access; (2) A high likelihood of accepting and publishing all submissions, provided the APC is paid (typically by the authors); (3) Absence of peer review, resulting in unvalidated scientific content; (4) Poor editorial quality; and (5) Uncertainty regarding journal ownership and the authenticity of its stated location.

Significance of "Predatory Journals"

Based on an aggressive policy of soliciting manuscripts through thousands of spam emails (claiming the recipient's prestige) and high acceptance rates, "predatory journals" have established themselves as a lucrative business opportunity arising from the "publish or perish" culture, professionals' lack of awareness, and many researchers' unmet needs to achieve acceptance in established journals. In exchange for near-immediate publication and free online access, predatory journals present questionable scientific quality, undermine research integrity, and confuse users, as an increasing number of people—including patients—read these journals and trust the information they provide. Consequently, it is crucial that members of the scientific community, at all levels, are aware of and conscious of this problem.

It is concerning that many authors who have published in predatory or pseudo-journals are uninformed about the quality and practices of these journals. In a survey of 43 editors and 206 authors selected from 2,227 potentially predatory journals, 17 editors (39.5%) were unaware that their name appeared on the journal, and 33 (76.7%) were only minimally familiar with predatory practices.[20] Among authors, 45 (21.9%) confirmed the lack of peer review, 68 (33%) knew something about predatory journals, and 62 (30.1%) believed their work had been published in this type of journal; however, after receiving information about predatory journals, 181 (87.9%) declared their intention not to publish in them in the future.[20]

In a recent survey involving 426 oncologists, 13.4% acknowledged having published in predatory journals, citing pressure to publish, speed of publication, and the possibility of achieving academic advancement in a short time.[21] In 67.8% of cases, contact had been made by email, and more than 50% of respondents were unaware of the nature of these journals. Multivariable analysis showed that practising in low- or middle-income countries was an independent factor associated with publication in such journals, while paradoxically, prior experience in academic publishing was not a protective factor.[21]

Other significant issues concern the possible inclusion of these journals in databases with well-established reputations (such as PubMed, PubMed Central, Scopus, Web of Science). Two studies published in 2017 revealed the indexing of rehabilitation and neuroscience journals listed in Beall's list within the PubMed and PubMed Central databases,[22,23] although it is possible that the results obtained—7 of 59 rehabilitation journals (11.9%) and 25 of 101 neurology journals (24.7%)—may no longer be replicable eight years later due to the dynamic flow of journals being added and removed from these repositories.

Moreover, the integration of articles published in predatory journals into systematic reviews is also a cause for concern, as this may ultimately distort results and influence conclusions.[24] An analysis of primary studies included in 100 randomly selected systematic reviews published in five top dermatology journals between 2019 and 2021 found that 31 (31%) contained at least one primary study published in a predatory journal according to Beall's list.[25] However, the number of primary studies from preda-

Table 3
Key differences between predatory journals and legitimate open access journals.

Feature	Legitimate open access journals	Predatory journals
Peer review	Strict	Inconsistent or absent
Article Processing Charge (APC)	High[a]	Low
Location	Mainly in developed countries	Mainly in developing countries
Impact factor	Real, as calculated by Journal Citation Reports (JCR®) or Scimago Journal Ranking	Fabricated or absent
Editor and editorial board	Well-recognised professionals with academic and scientific backgrounds	Less recognised
Solicitation of articles	None	Spam e-mails
Publication time from submission	Standard (several weeks/months including peer review)	Few days (speed as bait)
Journal title	Unique	Similar to legitimate journal or combining disparate/general fields (e.g., Nutrition & Medicine)
Indexing	Quality-filtered databases (e.g., PubMed, DOAJ)	Repositories with lax or no quality filters
Instructions for authors	Complete and detailed (e.g., article structure, ethics)	Sparse and generic
Submission of manuscripts	Online platforms with electronic management systems (e.g. Editorial Manager®)	E-mail address
Types of articles	Standard and well specified (originals, brief originals, reviews, letters to the editor, etc.)	Varied (comments, opinion, perspectives, notes)
Article topics	Specific to journal's specialty	Non-specific, including multiple specialties
Membership of international biomedical publishing organisations	Yes, such as ICMJE, WAME, DOAJ, OASPA, COPE, EQUATOR	No, although may falsely claim affiliation
Agreements with national bodies for APC payment	Yes (e.g. in Spain CRUE/CSIC)	No

COPE: Committee on Publication Ethics; CRUE/CSIC: Conferencia de Rectores de las Universidades Españolas/Consejo Superior de Investigaciones Científicas; DOAJ: Directory of Open Access Journals; EQUATOR: Enhancing the Quality and Transparency of Health Research; ICMJE: International Committee of Medical Journal Editors; OASPA: Open Access Scholarly Publishing Association; WAME: World Association of Medical Editors.
[a] Generally higher than predatory journals.

tory journals was significantly lower in systematic reviews with meta-analyses than in those without.[25]

Another facet of the problem is the contamination of bibliographic references by citations of articles published in predatory, non-peer-reviewed journals. This is exacerbated by the propagation of these citations through the copying of references without consulting the original articles.[26] A study of 204 articles published in legitimate nursing journals which included citations of works published in predatory journals found that, in 158 cases (77.4%), the articles were used to underpin study design, methodology, or study findings.[27] Similarly, the four most frequently cited articles published in predatory journals received 38 citations in legitimate journals, demonstrating their continued use.[27]

Finally, public policies from funding bodies requiring open access availability of funded research and grants awarded to scientists to conduct studies and cover article processing charges (APCs) may indirectly contribute to the economic waste arising from publication in predatory journals.[28]

Attitude of scientific and academic organisations towards publication in "predatory journals"

The issue of predatory journals has been analysed and discussed by scientific organisations upholding principles of transparency and best practices in academic publishing. The International Committee of Medical Journal Editors (ICMJE) explicitly recommends that researchers be aware of these journals' existence and avoid submitting manuscripts or citing their content. Scientific mentors and other colleagues or professionals with extensive experience in academic publishing can provide valuable guidance and information.

The Committee on Publication Ethics (COPE) (https://publicationethics.org) considers that the concurrent presence of three factors is sufficient to identify a predatory journal: concealment or lack of clarity regarding publication fees, absence of a quality peer review process conducted by subject experts, and guaranteed acceptance and/or a promise of very rapid publication (e.g., within a week or 48 h). Additionally, a journal authentication guide has been proposed based on false or misleading information, deviation from proper editorial practices, and lack of transparency, though it has yet to be validated.

Table 4
Checklist for the Think – Check – Submit initiative.[29]

Do you or any colleagues know the journal?
Is it easy to find the latest articles published in the journal?
Is it easy to identify and contact the publisher?
Is the publisher's name clearly displayed on the journal's website?
Can the publisher be contacted by telephone, email or post?
Is the journal clear about the type of peer review it uses?
Are the articles published in the journal indexed on the servers you use?
Are the publication fees clear?
Does the journal website explain what the fees are for and when they will be charged?
Do you recognise the editorial board?
Have you heard about the editorial board members?
Do members of the editorial board mention the journal on their own websites?
Is the publisher a member of any recognised initiative?
Are they members of the Committee on Publication Ethics (COPE)?
If open access, is it listed in the Directory of Open Access Journals (DOAJ)?
If open access, does the publisher belong to the Open Access Scholarly Publishing Association (OASPA)?
Is the publisher a member of any other organisation?

COPE: *Committee on Publication Ethics*; DOAJ: *Directory of Open Access Journals*; OASPA: *Open Access Scholarly Publishing Association*.

The World Association of Medical Editors (WAME) developed the Think – Check - Submit initiative, consisting of seven questions as a first step to evaluate journal quality and manuscript submission suitability.[29] As described in Table 4, these are straightforward questions to answer, except perhaps the involvement of the editorial group in organisations committed to publication standards.

There are other complementary means to assess the quality of open access journals. The DOAJ seal is a certification mark granted by the Directory of Open Access Journals (DOAJ) to high-quality

academic journals for their wide dissemination and adherence to best practices and high publishing standards. Approximately 8% of the 21,000 journals included in this database hold this distinction, though journals must pass an initial screening for inclusion. The absence of the DOAJ seal does not mean a journal is predatory. Membership of journals in other organisations committed to publishing ethics, such as the Open Access Scholarly Publishing Association (OASPA) or the ICMJE, as well as indexing in PubMed/PubMed Central—and especially in Web of Science, which provides reliable bibliometric citation indicators—are other irrefutable quality markers.

Finally, editors of 14 highly prestigious academic journals and ICMJE members, concerned about the predatory journal phenomenon, have simultaneously published a reflection on how to protect researchers from becoming "prey" to such journals. From the authors' side, it is important to know the problem, seek help from expert mentors, colleagues and librarians, verify article submission requests, and apply the questions of the Think – Check – Submit initiative described in Table 4. Academic institutions must use appropriate communication channels and dissemination materials to keep health professionals—especially young researchers—well informed, as they are one of the most vulnerable groups due to limited experience and lack of mentorship. Journal editors and publishers must inform readers, authors and reviewers of the scope of this problem and analyse and report any illegitimate publications that imitate or attempt to replace the journal. Without awareness and joint action by all stakeholders, protection against the reality of 'predatory journals' is not possible.[30]

Concluding remarks

The consolidation of the open access publishing model and the payment of article processing charges (APCs) has revealed the potential profitability of charging for publication without providing corresponding quality, scientific rigour, or authenticity. In the context of the pressure to publish articles in order to consolidate professional and academic positions, as well as the credibility of healthcare institutions and the merit of research centres, 'predatory journals' have emerged. Disguised as established academic journals, they target inexperienced and uninformed scientists who see them as a way to quickly and easily increase their publication output. Predatory publishers and journals pose a serious risk due to deception, falsehoods, and the usurpation of multiple quality attributes of legitimate academic journals, especially regarding their role as a medium for disseminating authentic scientific information verified through rigorous peer review and the competence of their editors.

While it is clear that legitimate open access journals have nothing to do with predatory journals, what are the warning signs? In my opinion, the combination of several of the following:

- Invitations via dubious emails, promising rapid publication and implicit acceptance. The initial contact never mentions the fee that will have to be paid to publish.
- The journal is not indexed in PubMed/PubMed Central.
- The journal does not appear in the Journal Citation Reports (JCR®) of Web of Science, meaning it lacks an impact factor.
- The journal's title may resemble that of a prestigious academic journal (by changing or adding a word) to deceive the recipient.
- The subject matter of the published articles is varied and the frequency of publication is irregular.
- The peer review system is not explained, and the instructions for authors are scant.
- Manuscripts can be submitted by email, instead of through the regular channels established by legitimate academic journals via their websites.

Having considered these points, other realities deserve attention: what are the consequences for authors? How are research outputs published in predatory journals judged? According to evaluation criteria for scientific productivity where impact factor[1] and journal quartile hold decisive weight, the most painful outcome for authors is that their effort may be wasted, since without an impact factor the intrinsic value of the research may disappear. Certainly, not all legitimate academic journals—whether open access or not—have an impact factor, so the suitability of bibliometric indicators as essential judgement criteria should be reconsidered. The strength of the editorial board publishing the journal, but above all the professional competence and scientific rigour of the editors, are key given their multiple responsibilities. Chief among these is the mission to safeguard the validity of peer review, a commitment unanimously accepted within the scientific community.

Ethical considerations

This work does not involve the use of human subjects.

Funding

None.

Declaration of competing interest

None.

References

1. Beall J. Medical publishing triage - chronicling predatory open access publishers. Ann Med Surg (Lond). 2013;2:47–9, http://dx.doi.org/10.1016/S2049-0801(13)70035-9.
2. Butler D. Investigating journals: the dark side of publishing. Nature. 2013;495:433–5, http://dx.doi.org/10.1038/495433a.
3. Beall J. Predatory journals threaten the quality of published medical research. J Orthop Sports Phys Ther. 2017;47:3–5, http://dx.doi.org/10.2519/jospt.2017.0601.
4. Beall J. Criteria for determining predatory open-access publishers. Available from: https://beallslist.net/wp-content/uploads/2019/12/criteria-2015.pdf [Accessed 4 January 2025].
5. Mimouni M, Braun E, Mimouni FB, Mimouni D, Blumenthal EZ. Beall's list removed: What stands between us and open access predators? Am J Med. 2017;130(8):e371–2.
6. BOAI. Budapest Open Access Initiative. Available from: https://www.budapestopenaccessinitiative.org/ [Accessed 5 January 2025].
7. Sociedad Max Planck. La Declaración de Berlín sobre acceso abierto. GeoTrópico. 2003;1:152–4 [Accessed 5 January 2025]. Available from: https://openaccess.mpg.de/67627/Berlin_sp.pdf
8. Pulido M. Meaning and relevance of paper mills. Med Clin (Barc). 2024;163:291–3.
9. Pulido M. The challenge of artificial intelligence in medical writing and editing. Med Clin (Barc). 2024;163:186–8.
10. Cukier S, Helal L, Rice DB, Pupkaite J, Ahmadzai N, Wilson M, et al. Checklists to detect potential predatory biomedical journals: a systematic review. BMC Med. 2020;18:104, http://dx.doi.org/10.1186/s12916-020-01566-1.
11. Dadkhah M, Bianciardi G. Ranking predatory journals: solve the problem instead of removing it! Adv Pharm Bull. 2016;6:1–4, http://dx.doi.org/10.15171/apb.2016.001.
12. Shamseer L, Moher D, Maduekwe O, Turner L, Barbour V, Burch R, et al. Potential predatory and legitimate biomedical journals: can you tell

[1] Starting from the latest 2023 edition of the Journal Citation Reports® (JCR®), journals previously indexed in the Emerging Sources Citation Index (ESCI) have received an impact factor for the first time and have been incorporated into the Science Citation Index Expanded (SCIE) list. This development explains the substantial increase in the number of journals with an impact factor across all specialties.

the difference? A cross-sectional comparison. BMC Med. 2017;15(1):28, http://dx.doi.org/10.1186/s12916-017-0785-9.
13. Mondal H, Mondal S. Pressure to publish: index Copernicus and predatory journals are helping (?) academicians. Indian Dermatol Online J. 2019;10:332–4, http://dx.doi.org/10.4103/idoj.IDOJ_225_18.
14. Labastida Juan I. Open Access: An analysis of European publisher copyright and licensing policies today. Septentrio Conference Series; 2020. p. 4, http://dx.doi.org/10.7557/5.5602.
15. Forero DA, Oermann MH, Manca A, Deriu F, Mendieta-Zerón H, Dadkhah M, et al. Negative effects of "predatory" journals on global health research. Ann Glob Health. 2018;84:584–9, http://dx.doi.org/10.9204/aogh.2389.
16. Cortegiani A, Longhini F, Sanfilippo F, Raineri SM, Gregoretti C, Giarratano A. Predatory open-access publishing in Anesthesiology. Anesth Analg. 2019;128:182–7, http://dx.doi.org/10.1213/ANE.0000000000003803.
17. Hansoti B, Langdorf MI, Murphy LS. Discriminating between legitimate and predatory open access journals: report from the International Federation for Emergency Medicine Research Committee. West J Emerg Med. 2016;17:497–507, http://dx.doi.org/10.5811/westjem.2016.7.30328.
18. Richtig G, Berger M, Lange-Asschenfeldt B, Aberer W, Richtig E. Problems and challenges of predatory journals. J Eur Acad Dermatol Venereol. 2018;32:1441–9, http://dx.doi.org/10.1111/jdv.15039.
19. Kachooei A, Bachoura A, Hirsch D, Beredjiklian PK. Predatory journals in orthopaedic surgery. J Am Acad Orthop Surg. 2023;31:181–8, http://dx.doi.org/10.5435/JAAOS-D-22-00671.
20. Cohen AJ, Patino G, Kamal P, Ndoye M, Tresh A, Mena J, et al. Perspectives from authors and editors in the biomedical disciplines on predatory journals: Survey study. J Med Internet Res. 2019;21:e13769, http://dx.doi.org/10.2196/13769.
21. El Bairi K, Trapani D, Nidhamalddin SJ, Khan SZ, Chowdhury AR, Lengyel CG, et al. Global landscape of the attack of predatory journals in oncology. JCO Glob Oncol. 2024;10:e2300287, http://dx.doi.org/10.1200/GO.23.00287.
22. Manca A, Martinez G, Cugusi L, Dragone D, Dvir Z, Deriu F. The surge of predatory open-access in neurosciences and neurology. Neuroscience. 2017;353:166–73, http://dx.doi.org/10.1016/j.neuroscience.2017.04.014.
23. Manca A, Martinez G, Cugusi L, Dragone D, Mercuro G, Deriu F. Predatory open access in rehabilitation. Arch Phys Med Rehabil. 2017;98:1051–6, http://dx.doi.org/10.1016/j.apmr.2017.01.002.
24. Rice DB, Skidmore B, Cobey KD. Dealing with predatory journal articles captured in systematic reviews. Syst Rev. 2021;10:175, http://dx.doi.org/10.1186/s13643-021-01733-2.
25. Ottwell R, Hightower B, Failla O, Snider K, Corcoran A, Hartwell M, et al. An evaluation of primary studies published in predatory journals included in systematic reviews from high-impact dermatology journals: cross-sectional study. JMIR Dermatol. 2022;5:e39365, http://dx.doi.org/10.2196/39365.
26. Pulido M, Carles González J, Sanz F. Errores en las referencias bibliográficas: un estudio retrospectivo en Medicina Clínica (1962-1992). Med Clin (Barc). 1995;104:170–4.
27. Oermann MH, Nicoll LH, Ashton KS, Edie AH, Amarasekara S, Chinn PL, et al. Analysis of citation patterns and impact of predatory sources in the nursing literature. J Nurs Scholarsh. 2020;52:311–9, http://dx.doi.org/10.1111/jnu.12557.
28. Manca A, Cugusi L, Cortegiani A, Ingoglia G, Moher D, Deriu F. Predatory journals enter biomedical databases through public funding. BMJ. 2020;371:m4265, http://dx.doi.org/10.1136/bmj.m4265.
29. Laine C, Winker MA. Identifying predatory or pseudo-journals. Biochem Med (Zagreb). 2017;27:285–91, http://dx.doi.org/10.11613/BM.2017.031.
30. Laine C, Babski D, Bachelet VC, Bärnighausen TW, Baethge C, Bibbins-Domingo K, et al. Predatory journals: what can we do to protect their prey? Lancet. 2025;405:362–4, http://dx.doi.org/10.1016/S0140-6736(24)02863-0.