



Stemming the rising tide of predatory journals and conferences: A selective review of literature

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The paper highlights the prevalence of predatory journals and conferences that damage science and research across all knowledge branches. They are characterized by rapid acceptance and publication, aggressive email marketing, lack of quality control, and charge hefty Article Processing Charges (APC) (for journal articles) and registration fees (for conference papers) from the authors. They thrive on the ignorance and naivety of early-stage, inexperienced, ambitious, and ingenuous researchers who have to adhere to publications' mandatory institutional requirements. Unfortunately, the senior researchers, despite knowing the downsides, publish, and present their research findings in predatory journals and conferences. The paper recommends that regulatory and funding bodies ensure that no credit or funding is given to publish and present in predatory journals and conferences. Libraries have a significant role to play – they should spread awareness among the researchers about the detrimental effect of fake publishing and conferencing; educate researchers about how to differentiate between bogus, fake journals, conferences, and the genuine ones.

Keywords: Research; Predatory journals; Predatory conferences

Introduction

Research is about communicating to a wider audience beyond geographical boundaries, and the Internet proves to be the best mode of communication. The advent of the Internet and associated technologies has led to the exploitation of the world wide web and the publishers jumping on the bandwagon to facilitate access to research findings through open access (OA). The “Open Access” envisages equitable access to information to all. Unfortunately, this is being misused by a particular unscrupulous community that has come to rule the roost by promoting predatory journals and conferences by trapping the gullible and unsuspecting researchers. However, all academicians /researchers are not innocent; possibly out of compulsion, some follow the route of predatory journals for producing a large number of research papers for promotional avenues in career. In recent times, the problem has gained frightening proportions worldwide because the system accords more importance to the number of publications instead of focusing on their contents and quality^{1,2}.

The first scholarly journal was published in 1665 by the name of Journal des Scavans in French³. The

same year witnessed the birth of Philosophical Transactions of the Royal Society in English³. Since then, the number of journals is increasing exponentially, and so has seen the evolution in publishing. We also see the emergence of many electronic journals at the end of the twentieth century. The technology-driven publishing excites the readers.

There are in excess to 33,000 journals in English, which publish 3 million articles a year. The data shows that 15-20% of articles published are available in OA journals with 10-15% more available via delayed access on the publishers' websites. The OA journals make up 26-29% of the total journals published. The Web of Science indexes 24,760 number of journals while Scopus covers in excess to 25,100 journals globally. These journals are commercial propositions and not a charity by the scholarly societies (Clarivate, 2020)⁴

It is important to underline the importance of “Open Access” journals for researchers and institutions at this juncture.

The wide dissemination of journals on the Internet is in the form of e-journals, parallel to the printed versions, which has paved the way to a new approach – now known as “Open Access”. The model is based

on the concept of being funded by authors, sponsorship, advertising, voluntary work, etc. The product is free in full text to the readers. However, growth is slower than expected. It can be attributed to the fact that the OA phenomenon has predominantly been contributed by startup publishers, though the established journals have jumped into the fray of late.

Open access publishing

The concept of “open access” emerged with the thought to provide equitable access to information to address the problems of restricted access and high subscription prices.⁵ It has two somewhat complementary variants, “Green Open Access” and “Gold Open Access”. The “Green Open Access” lets researchers put their manuscripts in institutional repositories, and that in turn makes them freely available to all. In the “Gold Open Access” model, authors pay Article Processing Charge (APC) to make their contents freely accessible upon publication. The established journals charge APC after the manuscript is accepted after getting peer-reviewed, followed by revision procedures. The predatory journals charge APC but do not follow any rigorous review processes. The downside of gold open publishing, which is embedded in the model, is that the number of papers a journal accepts increases its overall revenue. It has led to the mushroom growth of e-journals that exist to earn money by charging fees from the authors. On the other hand, there are “Gold Open Access” journals where the authors do not have to pay an APC. Still, the Gold OA journals ensure all scholarly content is peer-reviewed and freely accessible upon publication.

At the turn of the century, libraries worldwide began to experience the challenges of dwindling budgets, which resulted in libraries cancelling the print subscriptions for online subscriptions that offer user-friendly features of search, retrieve, download, and save.

While the new evolution of OA was being unveiled, the predatory publishing also came into existence mainly for two reasons – the easy availability of journal publishing platform and earning through an APC paid by the authors. The well-known case of Bohannon, a science journalist who submitted a sham medical paper to journals from DOAJ and erstwhile Beall’s List, highlighted how the predatory journals functioned. Many journals in Beall’s List accepted his paper⁶.

Jeffrey Beall, a former librarian at the University of Colorado in Denver, first coined the term “predatory

journals” and maintained a listing of predatory journals. He was the first to have observed the malpractices of the publishers closely (Beall, 2013). He studied, followed, and maintained a list of predatory journals online until 2017⁷. However, this can be noted here that there were serious allegations against Jeffrey Beall himself. He became infamous for his opaque deals while delisting some legitimate titles inadvertently (or intentionally) included in the Beall’s List⁸. Moreover, he had no institutional or scholarly society’s support while creating and maintaining the controversial Beall’s List. Other than sensitizing the issue of predatory journals, this list was an individual’s effort with minimal credentials. Later, Cabell’s International launched a revised version of the list called Cabell’s Blacklist, which can be accessed for a fee at its website. There are over 4,000 predatory journals, according to Cabell’s Blacklist⁹.

In this context, the paper highlights the detrimental impact of such predatory journals and conferences and how the naïve researchers in their early career stage are vulnerable to publishing in predatory journals and conference volumes after paying hefty sums of article processing fee (for journal articles) and registration fee (for conference papers).

It is widely acknowledged that whatever journals publish is final, definitive, and citable as a submitted manuscript undergoes a rigorous review process for methodology, language, and ensures that the findings are in sync with the methodology adopted; the data which underpin the findings will be made available for others to use, re-use, share or validate the research outcomes. Johnson, Watkinson, and Mabe (2018) have stated that the scholarly journal articles can rightfully claim precedence for research findings and help researchers keep abreast of their respective fields’ advancements. The scholarly journals also preserve the published contents for posterity. The researchers are often awarded for publishing in peer-reviewed journals¹⁰.

Whereas, the works in any predatory journal offer no value in terms of literary contribution since it does not undergo any of the established review processes. By paying a fee, any ‘researcher’ can become a prolific author in predatory journals.

The predatory publishers exploit the model of OA for their own profit-making at the expense of naïve researchers. As already established in the paper, the “Gold Open Access” scholarly publishing refers to

OA journals that do not charge any fees and make their contents available in OA immediately upon their publication. For examples, the scholarly articles published in the DESIDOC Journal of Library and Information Technology (DJLIT), and the Annals of Library and Information Studies (ALIS) are made available in OA mode immediately upon their publication. However, this may not hold good for all OA journals since each has its own policy to follow.

Within the category of predatory journals, another breed looks like the established journals and invites researchers to submit their manuscripts. Such journals are called hijacked journals. For example, the *Current Science* (CurrentScience.ac.in) is published by the Current Science Association in collaboration with the Indian Academy of Sciences. There was another journal with the same name available on CurrentScience.org, which was a hijacked one.

Delisting of predatory journals by UGC, India

In India, University Grants Commission (UGC) maintained a list of approved journals on its website, which was stood at 24,519 before its discontinuation, as counted by the authors from the website <https://www.ugc.ac.in/journallist/>¹¹.

In January 2017, UGC's whitelist had 32,659 journals identified and approved by the experts. The UGC Approved List of Journals is now replaced with the *UGC-CARE List of Quality Journals* with effect from 14th June 2019. Here CARE stands for the Consortium for Academic and Research Ethics, which is hosted at the Centre for Publication Ethics (CPE), Savitribai Phule Pune University in Maharashtra. All academic researchers must have their articles published in the journals enlisted in the UGC-CARE List. Only these publications will qualify for counting for career progression or faculty recruitment. UGC had also delisted 4305 journals from the previously approved list of journals because of their doubtful credentials. UGC also sought information on predatory journals if listed in the approved list of journals. A checklist is available on the website to identify a predatory journal.

This was done by UGC to prevent researchers from publishing in predatory journals. It has been reported that India has the dubious distinction of being home to a large number of predatory journals. DOAJ is a community-curated online directory that indexes and provides access to high quality, OA, peer-reviewed journals. At present, it indexes 15,253 journals published from 134 countries (DOAJ, 2020)¹². The

Web of Science indexes about 5000 OA journals (Clarivate, 2020). Scopus covers about 3600 OA journals. The Open Access Scholarly Publishers Association (OASPA) was launched in 2008 in the UK. It supports OA journal publishers' activities and suggests suitable business models, standards, and tools for OA journals (OASPA, 2020)¹³. In 2013, OASPA, in collaboration with the DOAJ, Committee on Publication Ethics (COPE), World Association of Medical Editors (WAME) published "Principles of Transparency and Best Practices" in scholarly publishing¹⁴. The International ISSN Centre provides guidelines for registering an International Standard Serial Number (ISSN) of a periodical; a journal may be denied ISSN if it gives the wrong information¹⁵.

Predatory journals and their characteristics

A predatory OA publisher exploits OA publishing's business model, which involves charging the author's publication fees but does not follow the editorial and publishing policies and services associated with a legitimate journal (UGC, India)¹⁶. The predatory journals are also characterized by the rapid acceptance of publications, lack of quality control, aggressive email marketing, and alluring authors into publishing with them (Tella, 2020; Manley, 2019)^{17, 18}.

The experts analyzed 8000 active predatory journals that concluded a spurt in the number of articles published in them. In 2010 it was 53,000, whereas it jumped to 420,000 in 2014. Most of these journals were published in Asia and Africa. On average, the authors paid USD 178 as processing fee per article and got it published within two to three months of submitting the manuscripts (Shen and Bjork, 2015)¹⁹.

The predatory journals solicit manuscripts on a wide range of subjects and claim to send for review within three days of submission and publish within ten days thereafter. For instance, the International Journal of Latest Research in Engineering and Management covers all engineering, pharmacy, humanities, and business management areas. The publishers or owners of predatory journals name their journals after the established or reputed journals of the field and claim to have a high impact factor. They also falsely profess that they are covered in the international and citation databases. Jeffery Beall (2016)²⁰ has written extensively about the predatory journals. He prepared four lists, one for the predatory and questionable publishers; the second list is of standalone predatory journals. In 2015, he added two

additional lists-misleading metrics and hijacked journals. To make the researchers believe in these predatory journals, some firms generate fabricated impact factors on other parameters. The list of such firms was provided in 'Misleading Metrics'. Similarly, fake websites resembled the original websites of legitimate journals. They were termed as hijacked journals.

Beall (2012)²¹ used 25 parameters to prepare a list of predatory journals. He consulted COPE's Code of Conduct for journal publishers, Principles of Transparency, and Best Practices in Scholarly publishing from the WAME, COPE, DOAJ, and OASPA. However, many observed that Beall was against the journals and publishers located in the global south. He was incredibly biased towards the for-profit multinational publishers, operating from the Global North and having a clutch in the Gold OA publishing model.

Dadkash and Bianciardi (2016)²² have ranked predatory journals by considering various parameters like editorial members, review and publishing procedures, announcements, OA policies. Their study has introduced a predatory rate between 0 and 1. If the predatory rate is 0, it means that the journal is not predatory. In case it is more than 0 but less than 0.22; the journal is a predatory one. The study has used 80 predatory and 70 non-predatory journals to analyze and rank them. Shamseer et al. (2017)²³ have compared predatory journals, fully OA journals, and hybrid journals from Beall's List, PubMed Central, and abridged Index Medicus, respectively. Their study has highlighted that the predatory journals' websites have more spelling errors; they use distorted or unauthorized images and promote false impact metrics. The predatory journals charge less APC as compared to the other categories of journals. The authors have also identified 13 parameters used by the potential authors to distinguish predatory journals from legitimate journals. The predatory journals advocate that manuscripts be submitted through emails, do not have any submission portal like Scholar One. They do not have archiving and retraction policies. Their email addresses are not journal affiliated. Their study also reported that 13.07% of the legitimate journals did not have an Editor-in-Chief (EIC). Bolshete (2018)²⁴ analyzed 13 predatory publishers in the biomedical field and highlighted that they have different publication houses with different names to deceive potential

authors from other countries. Many publishers claim to be indexed on websites that are not abstracting and indexing services (Gutierrez, Beall, Forero, 2015)²⁵. Some websites provide spurious impact factors that have no validity. The predatory journals claim to have senior professionals and researchers on their editorial boards without their consent or even after if they had declined to be on the board (Dyrud, 2014)²⁶. The predatory journals also claim to be long-established scholarly journals, whereas they might have been only a few years old. Generally, they operate from some western countries but invite submissions from researchers located in developing countries, which are supposedly easy prey because of their innocence to believe that everything from a western country is theoretically authentic, ethical, and trustworthy. The predatory journals do not show full details of the location (Beall, 2013)⁷.

The names of these (predatory or fake) journals are also very close to the names of legitimate publications, so "some researchers have been tricked into submitting papers." They would also send emails, saying that "We would like to follow up on your previous article, [title,] to see whether you have additional thoughts on the topic." Or, an article someone might have co-authored in an established journal or a resembled journal.

Predatory conferences

Conferences have tremendous importance for all stakeholders. The new researchers may network and collaborate for academic and research pursuits. Interaction is the essence of professional development; the participants can exchange information about the best practices that others follow. Further, the junior researchers interact and listen to the stalwarts of the field as keynote speakers. The problems of predatory journals have been aggravated by the emergence of predatory conferences, also known as fake, questionable bogus, or vanity conferences²⁷. Predatory publishers or specialized conference groups organize them; they have the common goal of profit-making and no interest in advancing the frontiers of science and knowledge. The predatory conferences use WebCrawler to locate information of authors, potential attendees from the journals' websites.

The predatory conference organizers send information through free email accounts. Sent out information contains many grammatical errors. The organizers charge for attendance, abstract presentation, and commit to publishing the submitted papers in

peer-reviewed journals. The predatory organizers claim to be long-standing in the field and name their conferences or meetings as international, global, or world conferences. At times, these conferences can be cancelled with no provision for refunding registration fees; having a smaller number of delegates significantly through it may be named international, global, or world conference. Some conference organizers project themselves as legitimate ones by announcing accreditation with the CPD Certification Service, UK. The first-time authors who are corresponding authors, too, get unsolicited emails from predatory journals and fraudulent conference organizers to submit manuscripts to journals and participate in the conferences (Mercier *et al.*, 2018)²⁸. The predators play on these sentiments to attract participation. It is easy to create a website and invite submissions from early career researchers and charge hefty article processing charges. McCrostie (2016)²⁹ and Grove (2017)³⁰ have suggested a checklist for deciding if a conference is a predatory or genuine one.

Asadi *et al.* (2019)³¹ have identified sixteen signs of bogus conferences, and the organizers commit to publishing the presented papers in Scopus or Web of Science indexed journals. They tell that there is an option to attend the conference virtually and get a certificate of attendance. Their websites do not provide adequate details about different committees, keynote speakers, or intentionally provide wrong information about them (Bourgault, 2019)³². There are frequent changes in submission and registration deadlines, and even conference dates are changed. The predators send emails through free email service and refer to the previously published papers and invite the authors to present them at the conference, even though the theme may be entirely different. The organizers very often mutate their strategies to pretend to be serious, academic scientific conferences. At times, the organizers may hold multiple conferences simultaneously at the same venue (Asadi, 2019)³¹.

Prevalence of predatory journals and conferences in various subjects

The prevalence of predatory journals has been observed across different subjects. Oermann *et al.* (2016)³³ have identified 140 predatory journals from 75 publishers in the nursing field. Such journals publish one or two volumes and then stop publishing. The authors are misguided through email solicitations, and if they wish to withdraw their manuscript at a

later stage, they would not be allowed to do so, but are often forced to publish in the same journal. Lewinski and Oermann (2018)³⁴ analyzed 206 email invitations sent by predatory journals to the researchers of the nursing subject area. They found that the emails' language was very flattering and invited submissions on very general and broad topics. It was not easy to figure out that the emails were from predatory journals and publishers.

Ibba *et al.* (2017)³⁵ have analyzed the prevalence of predatory journals in computer science from 2011 to 2015. They reported that the growth decreased during 2015, presumably due to the enhanced awareness among the researchers' community. They also highlighted that some researchers deliberately published in predatory, low-quality journals. The predatory journals understand the predicament of researchers' academic compulsion, exploit the neo-researchers who wish to get their papers published in big numbers, and less time without the fear of being rejected by the accredited journals (Van Nuland and Rogers, 2016)³⁶. The problem of predatory conferences is prevalent in many subjects. Heasman (2019)³⁷, Cortegiani (2020)³⁸, and Darbyshire (2018)³⁹ have dwelt upon their menace in the dental sciences, anesthesiology, and nursing, respectively.

Reasons behind publishing and presenting in predatory journals and conferences

The experts feel that some factors lead to a symbiotic relationship between a researcher and predatory journals. The factors include the UGC's present API system, ignorance to identify a predatory journal, the pressure on the number of papers, time constraints, fear of rejection, and no credible research content (Raghavan *et al.*, 2017; Cobey, 2019)^{40,41}. Sometimes consciously, researchers publish in a predatory journal. For the academics who want to add credentials to a résumé, for instance, predator publishers come to their rescue. These pseudo researchers and scholars are not bothered about the credibility at national and international levels (Clark and Thompson, 2017)⁴². The senior researchers publish in predatory journals despite knowing their sinister practice for getting published fast (Darbyshire, 2018)³⁹. The analysis unveils that it is not a predator-prey relationship as academia often knows what they are doing.

Seethapathy *et al.* (2015)⁴³ analyzed 3300 papers published in 350 predatory journals and highlighted that researchers from colleges affiliated to universities

published 51% of the papers; researchers of private universities published 18%; 15% and 11% were from state universities, and national institutes respectively. It is very disheartening to observe that the researchers from institutes like ICAR, CSIR, ICMR, IITs, and NITs publish in predatory journals.

There is a fierce competition to publish in the core, high impact factor journals of the field. The researchers and faculty members, who work in the far-flung remote areas of the country and do not have access to grants resources and state of the art laboratories to perform, find predatory journals and conference proceedings) as accessible outlets to publish.

Junior researchers contribute to predatory journals and conferences early in a career. Researchers are naïve and cannot differentiate between a predatory journal and an accredited or indexed journal (Eaton, 2018)⁴⁴. Their inexperience leads them to submit their new work or the work which might have been previously rejected by an established journal to a predatory journal (Nicoll & Chinn, 2015)⁴⁵. The career promotion and incentives linked to the number of publications force researchers to publish in predatory journals (Demir, 2018; Hedding, 2019)^{46, 47}.

Further, there is a category of cognizant researchers who know well about a journal's credentials still go-ahead and publish since, for them, increasing the number of publications is a compulsion. They also lend their names for use in the predatory conferences, editorial boards. They do not mind to be associated with such activities that otherwise undermine the literary world's ethical standards.

The pseudo researchers aim to legitimize and advocate their research findings through publications and presentations in predatory and bogus conferences (Beall, 2016)²⁰. This is known as advocacy research; that is, they want to advocate their work through these channels, which otherwise would not be acceptable to core journals. Peer review extends a stamp of authenticity to the published content of journals.

The low acceptance rate and the long process of reviews of established journals and the pressure to survive in the "publish or perish" environment of the academic world is one of the compelling reasons for researchers to look for an easy publishing avenue. Predatory journals come as an easy way out to meet with ones' academic aspirations.

Xia et al. (2015)⁴⁸ have studied OA journals' author profiles and found that most authors in predatory

journals are from India, Nigeria, African, and the Middle East countries. The predatory journals also exploit the enthusiasm of the researchers to publish in OA journals. The OA articles get more citations, usage, downloads, and media attention (Wang et al., 2015)⁴⁹.

The researchers get credit for presenting at international conferences. They succumb to the lure of dressing up their CV by writing "delivered a keynote address, chaired a technical session at world symposium, an international conference" despite knowing that it is worthless (Asadi, 2019)³¹. This may result in researchers attending the conference and risking their reputation, time, and other resources. The researcher may want to publish indiscriminately because of 'publish or perish' syndrome (Manley, 2019)¹⁸. They may lack awareness and guidance from their seniors and supervisors (Sorooshian, 2017)⁵⁰.

The detrimental impact of predatory journals and conferences

The predatory journals and conferences provide a false foundation on which fake science and scientists thrive. A paper published in a predatory journal has the potential to lead others into believing in their research and use the same for their future research work. This could also prove to be damaging in medicine sciences where human lives are involved. The predatory journals and conferences do not advance the frontiers of knowledge but symbolize a regressive society.

The prevalence of predatory journals also affects serious and honest OA publishers. To survive, they also compromise on the quality of review and adopt shorter submission to publication times.

It has been observed that the predatory journals increased in Eastern Europe, Russia, the former Soviet Republic (Bealle, 2016)²⁰. It happens because once some predatory journals attract manuscripts, earn a considerable profit, this promotes other unscrupulous professionals to launch journals and invite submissions. The people, in general, confuse the predatory publishing with OA publishing. OA publishing follows all best practices of research and science publishing, while predatory publishing does not. It harms everyone, especially researchers in low and middle-income countries (Clark and Smith, 2015)⁵¹. The predatory journals publish low-quality submissions and exploit the noble idea, the neglect review process, and practices and fail to be transparent about the authors.

Derek de Solla Price long ago described the tendency to publish very much as, 'senility', which is

rampant among the faculty members and the scientists (Sarewitz, 2016)⁵². Even the senior scientists have observed that the majority of the research studies are unreliable. The factors like the production of poor-quality research and the responsibility to cite previous research and pressure to publish have a very detrimental effect. It has been observed in oncology that the cell lines used in the study are contaminated. Further, 10,000 research papers were published based on contaminated cancer cell lines (Sarewitz, 2016)⁵².

In April 2019, the US district court ordered OMICS International to pay the US government a fine of over \$50 million for following "unfair and deceptive practices" in publishing journals and organizing conferences. According to its website, <https://www.omicsonline.org/about.php>, OMICS was established in 2007, organized 3000+ conferences in the USA, Europe, and Asia in collaboration with 1000 scientific societies and publishes 700+ OA journals; there are 50,000 experts in the editorial teams. The court found that OMICS International provided wrong information to the authors about peer review, publishing fees, journal impact factors, and journals' indexing in abstracting and citation databases (Prasad, 2019)⁵³.

The predatory journals force the authors to transfer their full copyright to them. When a predatory journal owns a researcher's work, it is not certain that if it will be published in the future and the researchers' hard work is wasted (Darbyshire, 2018)³⁹. Even if the work gets published, it will not get visibility and citations (Brainard, 2020)⁵⁴. The predatory journals and conferences pose a severe threat to education and research, especially in medical sciences, where precious human lives are involved. They publish wrong fabricated data-based research findings that are worthless for one and all. They help the researchers dress up their CVs, which does not benefit anyone (Cortegiani *et al.*, 2020)³⁸.

Suggestions for researchers and other stakeholders

Think.Check.Submit. (Thinkchecksubmit.org) was launched in 2015. It helps the researchers in identifying the right journal to publish in. It aims to sensitize researchers on the issue of getting published in authentic journals. Further, it promotes integrity and honesty in publication and thus fosters trust in research and science. The researchers may use thinkcheckattend.org to find out about the right conference to attend and present their research at the authentic and genuine platform. Young researchers

are an easy victim to such predatory publishers, and they need to be made aware of such malpractices.

Research is a self-motivated and analytical study to seek answers to some questions that agitate a researcher's mind. The results are published to share new findings with a large peer group; it also provides a sense of satisfaction and achievements to the author for contributing to the advancement of Knowledge (Lakhotia, 2015)⁵⁵. But the professionals can't be forced to undertake research.

University libraries should offer training sessions on journalology. For example, the Ottawa Hospital Research Institute in Canada has a Center of Journalology that guides acceptable publication practices. It ensures compliance with ethics and integrity among the researchers (Krishan & Kanchan, 2018)⁵⁶. Researchers should be mentored and educated to select the target journals for publishing their research articles. Efforts need to be taken to curb the menace of predatory conferences. For instance, the ministry of South Korea is launching a system to help researchers identify and differentiate between predatory and genuine conferences. There should be a list of predatory conferences as Beall's List of predatory journals is in place (Sonne *et al.*, 2020)⁵⁷. The indexing databases should also exercise caution and vigil to maintain the quality of indexed journals and articles (Frandsen, 2017)⁵⁸. Lopez and Gaspard (2020)⁵⁹ have developed tools and techniques, namely, Scholarly Tools Opposing Predatory Practices (STOPPP), which the library professionals may use for evaluating the journals' websites, conferences, and decide if they are the standard ones in the field.

Recent policy interventions towards achieving research integrity in India

With the interventions of the apex institutions such as the UGC, Office of the Principal Scientific Adviser to GoI (PSA), national science academies, and other national apex science bodies, the national institutions have come together to address the menace of predatory journals and conferences. Several guidelines have been prepared to educate and train Indian scholars in handling academic integrity and scientific conduct matters. For example, the UGC introduced the *UGC (Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions) Regulations* in 2018 for higher educational institutions in India. Subsequently, in December 2019, the UGC recommended Indian universities to introduce a compulsory pre-doctoral

course on the *Research and Publication Ethics (RPE)* for raising awareness about the publication ethics and research misconduct. The course comprises three theory and three practice modules, namely Philosophy and Ethics, Scientific Misconduct, Scientific Conduct, Publication Ethics, Open Access Publishing, Publication Misconduct, and Database and Research Metrics. Introducing pre-PhD coursework on research and publication ethics in Indian universities is a welcome move to offer a uniform and structured curriculum for Indian researchers. Existing compulsory research methodology course has not equipped the doctoral students to practice responsible research at par the global standards. The proposed new course will help them understand the best practices and save them from publishing in bogus or predatory journals and presenting scientific papers in bogus or predatory conferences. Even after introducing the *UGC Regulations on Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions* in July 2018, most Indian universities offering Ph.D. courses did not update their research methodology course to teach about academic integrity and prevention of plagiarism. While this new RPE course will benefit the research students, a similar short-term course should also be introduced for the in-service faculty members and scientists in educational and research institutions. Some media reports recently showed many Indian research institutions and universities in a bad light due to scientists' breach of publication and research ethics. A compulsory pre-doctoral course on the RPE may facilitate improving the scholarship in Indian universities and research institutions. Additionally, the proposed module on OA publishing will help the researchers understand OA processes and policies at the national, institutional, journals' and funders' level. We would expect that the university and college librarians, documentation officers, and other senior academic officials get involved in successfully delivering the RPE course in every university offering Ph.D. and M.Phil. programmes.

Similarly, the Office of the Principal Scientific Adviser to GoI (PSA) prepared a draft *National Policy on Academic Ethics* in July 2019 with feedbacks from the Indian National Science Academy and the Indian Academy of Sciences⁶⁰. The draft document aims at cultivating ethical practices in all spheres of conduct in an academic working environment. It proposes the robust foundational

principles for upholding the integrity and ethical practices in an academic environment and streamlines the course of action to ensure the delivery of justice in malpractices. The suggested National Policy is expected to develop specific implementation programmes in scientific and higher educational institutions across the country.

The Indian National Science Academy organized a two-day Workshop on Ethics in Science, Education, Research, Outreach, and Governance in June 2018. The fellows of INSA and other science academies in India had raised their concerns in this Workshop, particularly concerning the rising instances of fake or predatory journals and conferences in India and abroad. This Workshop's recommendations were presented in an e-book titled "*Ethics in Science Education, Research and Governance*"⁶¹. In August 2019, the Indian Council of Medical Research (ICMR) released the *ICMR Policy on Research Integrity & Publication Ethics* to guide responsible research and ensure the highest professional & ethical standards in inception, conduct, and reporting, reviewing, and publication of research⁶². At the same time, in September 2019, the Council of Scientific and Industrial Research (CSIR) released a "*Statement on Scientific Misconduct in CSIR Laboratories and Interim Action Taken Thereon*", echoing the principles of responsible conduct of research⁶³. CSIR formed certain internal committees to look into the specific allegations of scientific misconduct, including publishing with the fake or predatory journals and conferences by a certain section of scholars. More involvement of LIS professionals is envisaged in the research establishments to inculcate an institutional culture of research and publication ethics and educate the scholars about the menace of predatory or bogus journals and conferences.

Conclusion

The threat from predatory journals and predatory conferences is real. It would not be out of context if blame were not passed on to the scholarly publishing industry as their self-regulation failure helped the predatory journals grow. There is a need to have a regulatory authority like any other industry. A potent authority like UGC who has put up a UGC-CARE List of credible journals, the responsibility thereof lies with the academics and researchers to observe a self-reform and self-regulation. Academic libraries also have a role to play; avoid patronizing the predatory

journals and funding to predatory conferences. Academic librarians are also expected to play a significant role in delivering a compulsory pre-doctoral course on the Research and Publication Ethics (RPE) in every university offering Ph.D. and M.Phil. programmes. Every institution should have an Institutional Academic Integrity Panel (IAIP) and many Departmental Academic Integrity Panels (DAIPs) to scrutinize the quality of research papers; plagiarism and authenticity of research contents backed by research data, as required by the *UGC Regulations on Promotion of Academic Integrity and Prevention of Plagiarism in Higher Educational Institutions, 2018*. The credibility of the journals must be investigated, questioned, and verified. The researchers should know of the serious consequences of being caught publishing in the predatory journals and attending or promoting predatory conferences. Institutional policies should be framed following the national policies and guidelines, which deter publication, presentation, and participation in predatory journals and conferences. Educational institutions should teach youngsters about ethical research practices and the importance of a peer review. University libraries should prepare white lists of journals (Berger, 2017)⁶⁴, update them regularly, and adopt measures to control predatory journals and conferences' mushroom growth. Libraries should undertake their basic responsibility of spreading awareness about the whole issue among all the stakeholders.

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