Original Research

ARTIFICIAL INTELLIGENCE-ASSISTED PEER REVIEW: A NARRATIVE REVIEW OF CURRENT EVIDENCE, APPLICATIONS, CHALLENGES, AND FUTURE PERSPECTIVES

Dr. Anupkumar D. Dhanvijay[1*], Dr. Nitin B. Dhokane[2], Dr. Mohammed Jaffer Pinjar[3], Dr. Anita Kumari[4], Dr. Nikhil Kumar[5], Dr. Sukrita[6]

[1*,3,4,5,6]All India Institute of Medical Sciences Deoghar Jharkhand.
[2]Government Medical College Gadchiroli Maharashtra.
Email: [1*]dranupkumard@gmail.com, [2]drnitindhokne@gmail.com, [3]jaffer.physiology@aiimsdeoghar.edu.in, [4]anita.physiology@aiimsdeoghar.edu.in, [5]nikhilk211@gmail.com, [6]sukritajsr@gmail.com
Corresponding Author: Dr. Anupkumar D. Dhanvijay
All India Institute of Medical Sciences Deoghar Jharkhan.

ABSTRCT

Background: Peer review remains the cornerstone of scholarly publishing, yet it faces persistent challenges including reviewer fatigue, delays, variability in quality, and increasing submission volumes. Recent advances in artificial intelligence (AI), particularly large language models and automated analytic tools, have prompted growing interest in their potential role in supporting and augmenting the peer review process.
Objective: This narrative review critically examines the current evidence on the effectiveness of AI-assisted peer review, highlighting its benefits, risks, limitations, and future prospects.
Methods: A narrative synthesis of the available literature on AI applications in peer review was conducted, focusing on empirical studies, survey data, and publisher reports published between 2019 and 2026.
Results: Available evidence suggests that AI tools can enhance efficiency by assisting with initial manuscript screening, technical checks, plagiarism detection, methodological appraisal, and structured summarization. AI-assisted peer review may reduce reviewer workload, improve consistency, and strengthen research integrity when used as a decision-support system. However, significant concerns remain regarding algorithmic bias, lack of transparency, confidentiality of unpublished manuscripts, overreliance on automated outputs, and the potential erosion of human judgment. The review synthesizes emerging models of human–AI collaboration, including human-in-the-loop and explainable AI approaches, and discusses their implications for editors, reviewers, authors, and publishers.
Conclusions: AI has the potential to meaningfully augment peer review but should not replace human expertise. Robust empirical research, clear policy frameworks, and continuous ethical oversight are essential to ensure that AI-assisted peer review strengthens, rather than undermines, the credibility and fairness of scholarly publishing. Recommendations for responsible and ethical use of AI in peer review are proposed, emphasizing transparency, accountability, bias monitoring, data governance, and alignment with international editorial standards.

Keywords: Artificial Intelligence, Peer Review, Scholarly Publishing, Research Integrity, Large Language Models, Editorial Decision-Making, Publication Ethics, Human–Ai Collaboration, Bias and Transparency.

INTRODUCTION

The well-established system of peer review as currently designed is stressed by trends in modern scientific research. With the exponential growth of published research across the globe, the burden on editors and peer reviewers has dramatically increased. Sustainability and efficiency issues attributable to the fatigue of reviewers, lengthy time frames for review, and variable quality of reviews have resulted in challenges in the identification of expert reviewers.

www.ajmrhs.com
eISSN: 2583-7761

Date of Received: 08-07-2026
Date Acceptance: 18-08-2026
Date of Publication: 17-09-2026

(Phuljhele, 2024) (Tennant & Ross-Hellauer, 2020). The advances in Natural Language Processing (NLP) that are part of the newer Large Language Models (LLMs) and the overall improvements in Artificial Intelligence (AI) have the potential to expand the use of AI within publication systems to tasks traditionally performed by editors. Current AI systems can pre-screen manuscripts, choose potential reviewers, check adherence to reporting guidelines, and examine manuscripts for possibly fraudulent images or manipulated data and assist in the drafting of focused peer review comments. (Chakraborty et al., 2025) (Yoo, 2025)

Peer reviews are viewed both with excitement and concern with AI introductions. AI potentially decreases review time and ensures consistency in review comments. However, there are ongoing

legitimate discussions concerning reviewer burden, the confidential nature of unpublished articles, trust in automated systems, and the overall challenge of bias in peer review. (Doskaliuk et al., 2025) (Chustecki, 2024)

While some publishers and editorial platforms have taken up the use of AI-assisted peer review tools, the evidence for their effectiveness, reliability and ethical implications is compartmentalized in empirical studies, policy statements, publisher reports and opinion articles, with limited cross-disciplinary synthesis (Kemal, 2025) (Stephen, 2022). Thus, the aim of this narrative review is to provide a critical review of the current applications of AI throughout the peer review process, summarize the available evidence on their effectiveness, discuss ethical and policy considerations and identify future research priorities. This review aims to offer a balanced, evidence-based viewpoint to encourage responsible adoption of AI in peer review, striving to maintain the vital role of human expertise and academic integrity.

METHODOLOGY

A narrative literature review was conducted to examine the current evidence on the application of artificial intelligence (AI), including natural language processing, machine learning, and large language models, in scholarly peer review. Relevant literature was identified through searches of PubMed/MEDLINE, Scopus, Web of Science, and Google Scholar, using combinations of terms such as artificial intelligence, generative AI, large language models, ChatGPT, peer review, scientific publishing, and editorial decision-making. Relevant empirical studies, reviews, surveys, policy documents, and conceptual articles were considered. The retrieved literature was thematically synthesized according to AI applications, effectiveness, benefits, limitations, ethical considerations, stakeholder perspectives, and future directions in AI-assisted peer review.

OVERVIEW OF THE PEER REVIEW PROCESS

Peer review is a formal process in which manuscripts submitted for publication are reviewed by experts in the field for scientific rigor, novelty, ethical compliance, and relevance. While workflows differ between journals and disciplines the common objectives are to maintain the quality, validity and integrity of scholarly research (Tumin & Tobias, 2019). Understanding the traditional workflow helps to identify where artificial intelligence (AI) can efficiently assist in editorial decision making.

Scholarly publication uses a variety of peer review models. In a single-blind review, reviewers are aware of the authors' identities but maintain their anonymity, which may introduce bias based on the reputation or institutional affiliation of the authors. Although total anonymity is frequently challenging to attain, double-blind review aims to reduce such prejudice by hiding the identity of both authors and reviewers. By disclosing reviewer identities and/or posting review reports, open peer review encourages transparency, but it may also make reviewers less inclined to offer critical assessments. Ongoing initiatives to increase efficiency, fairness, and openness include hybrid and post-publication models (Tomkins et al., 2017) (Ross-Hellauer, 2017).

Editorial screening for journal scope, ethical compliance, and submission requirements is usually the first step in the peer review process. Suitable submissions are then assigned to trained reviewers who evaluate the data analysis, presentation, interpretation, and methodological rigor before providing recommendations to the editor. Following one or more rounds of revision, editors consider the reviewers' feedback, resolve disagreements, and make the final decision on publication (Sizo et al., 2025) .

The peer review process continues to be an important part of scholarly publication yet suffers from issues like fatigue of reviewers, delays, lack of consistency, and bias. In addition, it does not necessarily identify any research misconduct (S. Mondal et al., 2023) (Polin & Levine, 2025). AI technology has the potential to improve the speed and consistency of peer review while retaining essential human oversight. It can assist with article screening, reporting guideline compliance, plagiarism detection, reviewer selection, and technical assessment (Doskaliuk et al., 2025) (Polin & Levine, 2025). Table 1 summarizes the key phases of the peer review process and the related AI integration points.

Table 1: AI Integration Points in the Peer Review Workflow

Workflow Stage	Relevant AI Integration Points
Manuscript submission	Technical checks, plagiarism detection, image manipulation detection, language assessment
Editorial triage	Manuscript summarization, quality screening, integrity flags
Reviewer identification	Reviewer matching algorithms
Peer review generation	AI-assisted review drafting, summarization, language tools
Editorial decision	Decision-support analytics, summarization

Post-publication monitoring	Integrity surveillance, plagiarism re-checks, citation monitoring

ARTIFICIAL INTELLIGENCE TECHNOLOGIES UNDERPINNING PEER REVIEW

Artificial intelligence (AI)-assisted peer review relies primarily on natural language processing (NLP), machine learning (ML), and large language models (LLMs) (Farber, 2024) (Kousha & Thelwall, 2024). NLP enables automated analysis of manuscript text, including language quality, reporting guideline compliance, and key methodological elements. ML supports manuscript classification, reviewer recommendation, anomaly detection, and quality assessment, while deep learning can assist in detecting image manipulation and statistical inconsistencies (Kousha & Thelwall, 2024).

Recent advances in LLMs have expanded AI applications to manuscript summarization, structured review drafting, and editorial decision support. Despite these capabilities, current AI systems remain susceptible to bias, hallucinations, and limited contextual reasoning, particularly when evaluating scientific novelty and methodological significance. Therefore, AI should be regarded as a decision-support tool that complements, rather than replaces, expert reviewers and editors (Doskaliuk et al., 2025).

APPLICATIONS OF AI ACROSS THE PEER REVIEW WORKFLOW

As a decision-support tool that improves editorial efficiency rather than taking the place of human judgment, artificial intelligence (AI) has been progressively included into various phases of the peer review workflow (Doskaliuk et al., 2025) (Madanchian & Taherdoost, 2025).

Initial manuscript screening, where AI evaluates journal scope, manuscript completeness, formatting, and adherence to ethical and reporting rules, is one of its most well-known uses. In order to help editors find missing components early in the review process, several platforms also assess compliance with reporting guidelines for randomized trials, systematic reviews, and observational studies. However, these instruments need professional supervision since they evaluate reporting completeness rather than methodological quality (Al-Quorain et al., 2026) (Schulz et al., 2022) (H. Mondal et al., 2023).

In order to find qualified specialists and uncover possible conflicts of interest, AI also aids in the selection of reviewers by analyzing publication records, keywords, citation networks, and reviewer performance. By consistently choosing reputable researchers, these algorithms may reinforce preexisting biases even when they increase efficiency (Farber, 2024) (Nashwan, 2025).

AI techniques can increase research integrity by identifying statistical inconsistencies, reporting errors, plagiarism, citation anomalies, and picture manipulation for technical quality assessment. Editorial decision letter preparation, structured review drafting, and manuscript summarizing are all further aided by large language models. However, AI-generated outputs are still prone to errors and need to be carefully verified by humans, especially when it comes to editorial choices (P. S. Park et al., 2024).

All things considered, AI has a great deal of promise to enhance peer review's effectiveness, consistency, and integrity. Adoption varies throughout publications, nevertheless, and responsible use, open governance, and ongoing human supervision are necessary for successful implementation (Nashwan, 2025).

Table 2: AI Tools and Their Functions in Peer Review (Meo & Talha, 2019) (Checco et al., 2021) (Floridi, 2026) (Chaturvedi et al., 2025) (Caron et al., 2025) (Zhuang et al., 2025)

AI Tool / Platform	Primary Function	Stage of Peer Review	Type of AI Used
iThenticate	Plagiarism detection	Submission screening	Text similarity algorithms
Turnitin	Plagiarism and AI-writing detection	Screening / review	Text similarity algorithms
StatReviewer	Statistical and reporting checks	Peer review	Rule-based + ML
SciScore	Automated reporting guideline assessment	Screening	NLP
Penelope.ai	Technical and compliance checks	Pre-review	NLP
ScholarOne / Editorial Manager	Reviewer matching	Editorial handling	ML recommender systems

PubPeer / ImageTwin	Image and integrity analysis	Review / post-publication	Computer vision
Large Language Models (e.g., ChatGPT-like systems)	Review drafting, summarization	Reviewer support	Generative AI (LLMs)

ML - Machine Learning, NLP - Natural Language Processing

EVIDENCE ON EFFECTIVENESS OF AI-ASSISTED PEER REVIEW

Despite a sharp rise in interest, there is still a dearth of empirical data assessing the efficacy of artificial intelligence (AI)-assisted peer review. Instead of randomized assessments within standard journal processes, the majority of the data that is now accessible consists of pilot studies, observational investigations, comparative analyzes, and surveys evaluating AI-generated peer reviews, reviewer perceptions, and editorial applications. However, the growing body of research continuously shows that AI has significant potential to improve the effectiveness and consistency of peer review while pointing out significant constraints that presently prevent its independent application for editorial decision-making.

Robertson carried out one of the first empirical analyzes utilizing publications submitted to NeurIPS conferences, comparing GPT-4-generated reviews with traditional human peer reviews (Robertson, 2023). On a 5-point rating system, authors found AI-generated evaluations to be almost as useful as human reviews (mean helpfulness score 3.0 vs. 3.1). Although GPT-4 consistently provided correct manuscript summaries and well-structured evaluations, it was less able to detect subtle methodological flaws and produced fewer specific criticisms. According to the study's findings, GPT-4 could serve as a helpful peer-review assistant, but it should supplement experienced reviewers rather than take their place (Robertson, 2023).

Similarly, Saad et al. used 21 anonymised biomedical research articles to evaluate ChatGPT-3.5 and ChatGPT-4 with human reviewers (Saad et al., 2024). With similarity scores of 3.6/5 for ChatGPT-3.5 and 3.76/5 for ChatGPT-4, AI-generated reviews showed a moderate level of agreement with human evaluations. The authors found that current large language models (LLMs) are still inadequate for fully automated peer review due to their insufficient capacity to critically assess scientific merit and methodological rigor, even though ChatGPT increased the speed and consistency of review creation (Saad et al., 2024).

According to more recent studies, improvements in LLMs have significantly raised the calibre of reviews. Using eleven published hand surgery publications, Marrella et al. assessed GPT-4o and ChatGPT-o1 and discovered that AI-generated reviews obtained considerably higher ARCADIA quality scores than reviews created by human reviewers (mean scores 4.8–4.9 vs. 2.8–3.2)(Marrella et al., 2025). Reports produced by AI were thorough, organized, and internally consistent. However, AI showed poor agreement with editorial publication decisions, often suggesting acceptance of papers that had previously been rejected by higher-impact journals, even while it produced higher-quality review reports based on established scoring standards. These results show that editorial judgment and review quality are not interchangeable, and that AI presently lacks the sophisticated scientific reasoning needed for publication decisions (Marrella et al., 2025).

A comparative analysis of 398 peer review reports from 119 *BMJ Open* articles demonstrated important differences between human and AI-generated reviews. Human reviewers produced more detailed and thematically diverse assessments, particularly for interpretation, originality, and applicability, whereas AI reviews covered more manuscript sections but were predominantly focused on routine and structural aspects. Co-occurrence analysis showed broader connections among themes in human reviews, while AI-generated comments were more structurally clustered; the higher Shannon Index for human reviews further confirmed their greater thematic diversity. These findings suggest that AI may be particularly useful for standardized and format-related screening, but human expertise remains critical for contextual interpretation and higher-order scientific judgment (Rajakumar et al., 2026).

A number of investigations have shown significant shortcomings in the present AI reviewers. Using 400 conference papers, Bonifazi et al. examined reviews produced by GPT-4o Mini and Gemini models. They found that AI-generated scores clustered around average values and had weak discrimination between accepted and rejected articles (Bonifazi et al., n.d.). Additionally, AI reviewers were susceptible to prompt manipulation, with submissions containing hidden prompts that had a substantial impact on review results. Similar issues were raised by Baumann et al., who examined more than 75,000 peer reviews from ICLR 2026 and showed that AI-generated evaluations were significantly more similar than human reviews, resulting in a "hivemind effect" marked by a decrease in reviewer opinion diversity (Baumann et al., 2026). Concerns about robustness, fairness, and dependability in editorial decision-making were raised by the fact that AI reviewers gave inflated scores, correlated poorly with human evaluations, and were vulnerable to manipulation through AI-

assisted article rewriting ("paper laundering") (Baumann et al., 2026).

Studies on reviewer perception offer more data about the usefulness of AI in real-world applications. According to Ebadi et al.'s qualitative survey of seasoned journal reviewers, reviewers thought generative AI was useful for lowering workload through technical consistency checks, language editing, plagiarism detection, and manuscript screening (Ebadi et al., 2025). However, participants repeatedly stressed that AI should only be used as an auxiliary tool under constant human supervision because it is unable to assess originality, novelty, and scientific relevance (Ebadi et al., 2025). Similar results were found in an international survey of researchers from various nations by IOP Publishing, where about one-third of reviewers said they had already used AI tools during peer review, mainly for manuscript summarization, grammar correction, and language refinement ("AI and Peer Review," n.d.). The majority of responders stressed the need for increased openness, standardized publication standards, and secure AI platforms that safeguard manuscript confidentiality despite this increasing acceptance ("AI and Peer Review," n.d.). They also indicated uneasiness with AI-generated peer-review reports.

Large-scale international surveys also show that reviewers are adopting AI at an accelerating rate. More than half of peer reviewers (53%) reported utilizing AI during manuscript review, primarily for preparing review reports, summarizing papers, and language-related chores rather than actual scientific evaluation, according to a Frontiers Media poll of 1,645 scholars worldwide. The need for responsible implementation strategies is further supported by the fact that respondents acknowledged significant efficiency advantages but continued to voice concerns about bias, secrecy, inadequate governance, and inadequate reviewer training (*AI in Peer Review: What Early-Career Researchers Should Know (and How to Use It Wisely)*, n.d.).

All of the evidence that is currently available shows that AI excels at structured and repetitive peer review tasks, such as summarizing manuscripts, editing language, assessing reporting guidelines, detecting plagiarism, and producing preliminary review drafts (Doskaliuk et al., 2025) (Ebadi et al., 2025). When it comes to assessing scientific originality, methodological innovation, clinical relevance, multidisciplinary significance, and overall publishing appropriateness, contemporary AI systems are still far less trustworthy (Kowald et al., 2024) (Jeyaraman & Jain, 2024). Rather than being the result of true scientific thinking, these limits primarily reflect the statistical pattern-recognition capabilities of modern LLMs.

A human-in-the-loop paradigm, in which AI serves as a decision-support system rather than an independent reviewer, is generally supported by the available data (Lazaros et al., 2026). While human reviewers continue to be essential for contextual interpretation, ethical judgment, and evaluation of scientific innovation, AI consistently increases efficiency, uniformity, and reviewer output across experimental comparisons, observational studies, and reviewer surveys (Yang et al., 2026). However, the majority of current research is constrained by cross-sectional survey methods, discipline-specific datasets, small sample sizes, or simulated review environments. Before recommending wider adoption, large multicentric prospective studies assessing AI-assisted peer review under actual editing situations are required.

BENEFITS OF AI-ASSISTED PEER REVIEW

By assisting human judgment rather than taking its place, artificial intelligence (AI) improves peer review. One of its main benefits is that it frees up reviewers to concentrate on scientific evaluation by automating repetitive chores including initial article screening, language and formatting checks, and reporting completeness assessment (de Bessa & Gomes, 2026)(44).

By speeding up desk screening, reviewer matching, and reviewer comment synthesis, AI also increases editorial efficiency, reducing review times and enabling quicker editorial judgments. While final evaluations still require expert judgment, standardized AI-assisted assessments might encourage greater consistency and transparency across submissions (Doskaliuk et al., 2025).

AI helps editors make important decisions by summarizing papers, spotting possible issues, and combining reviewer opinions to help handle growing submission volumes. While research integrity tools improve quality assurance by identifying plagiarism, image manipulation, and reporting errors that could otherwise go unnoticed, AI-assisted tools may also help inexperienced reviewers by providing structured instruction (Fuente-Ballesteros & Zuin Zeidler, 2026).

In addition to enhancing daily editorial processes, AI makes peer review systems more scalable, produces structured data for assessing editorial performance, and, when used in standardized tests, may lessen reviewer bias. While centralized AI systems provide openness through traceable editorial outputs, generative AI can further improve the clarity and uniformity of review reports by helping reviewers draft constructive input (Doskaliuk et al., 2025).

However, responsible implementation is necessary to reap the benefits of AI-assisted peer review. To guaranty that efficiency advantages do not jeopardize ethical norms or scientific integrity, effective data governance, manuscript confidentiality protection, and ongoing human

monitoring are still crucial (Sharma & Sarode, 2026).

LIMITATIONS AND CHALLENGES OF AI-ASSISTED PEER REVIEW

Artificial intelligence (AI) is still an assistive rather than autonomous technology in scholarly peer review despite its rapid advancements because it lacks the scientific reasoning, domain experience, and contextual awareness necessary for thorough manuscript evaluation (Shahzad et al., 2025). Large language models (LLMs) struggle to evaluate scientific novelty, originality, methodological innovation, therapeutic relevance, and multidisciplinary significance, despite their ability to efficiently summarize articles, spot reporting flaws, and produce structured critiques. In these higher-order evaluative tasks, human reviewers routinely outperform AI, according to comparative studies (Eriksson et al., 2026).

Even though they are objective and well-structured, the highly standardized reviews produced by current AI systems frequently lack vital nuance and diversity of viewpoint. This "hivemind effect" could possibly harm novel or unusual research and limit the variety of scientific viewpoints necessary for thorough peer assessment (Shcherbiak et al., 2024). Furthermore, accurate editorial decisions are not always correlated with the quality of reviews produced by AI. AI frequently assigns exaggerated or poorly discriminative scores, and studies have revealed poor agreement between AI suggestions and editorial outcomes (S. Park & Nan, 2026).

Expert verification is crucial before AI-generated outputs impact editorial decisions since AI systems are susceptible to rapid manipulation, hallucinations, fake citations, and factual errors. Another issue is algorithmic bias. While reviewer-selection algorithms may favourably identify highly cited researchers, AI models trained on existing literature may reinforce biases pertaining to language, geography, institutional reputation, and publication history (Voloch & Hirschprung, 2026).

Additional ethical issues include data governance and confidentiality. Concerns about data storage, intellectual property, and possible reuse of private content are raised when unpublished papers are uploaded to commercial cloud-based AI platforms. Therefore, unless safe institutional or publisher-managed systems are available, several publishers advise against using publicly available AI technologies for private peer review(Ross-Hellauer & Horbach, 2024).

Lastly, there is still a little body of evidence. Instead of prospective evaluations carried out within standard editorial workflows, the majority of published research use small datasets, conference papers, simulated review environments, or reviewer questionnaires (Dore et al., 2026). Therefore, until more solid real-world evidence becomes available, AI should continue to operate inside a human-in-the-loop framework, with expert reviewers and editors retaining final responsibility for manuscript evaluation (Chinoracky & Stalmasekova, 2025).

ETHICAL, LEGAL, AND POLICY CONSIDERATIONS

Because it involves private, unpublished research and directly affects editorial choices and scientific reputation, the incorporation of artificial intelligence (AI) into peer review presents significant ethical, legal, and regulatory issues. Strong governance, openness, and human monitoring are necessary to guaranty that AI enhances rather than erodes confidence in academic publishing.

Data security and confidentiality are important issues. If the proper precautions are not in place, manuscripts processed by AI tools—especially cloud-based systems—may be retained or utilized for model training. According to surveys, many reviewers are still hesitant to submit unpublished papers to publicly accessible big language models due to worries about intellectual property, data security, and adherence to publication confidentiality regulations (Chigwada & Ngulube, 2026). Therefore, to reduce unwanted data exposure and maintain research integrity, editorials and policy statements advise integrating AI within secure publisher-managed editorial platforms rather than commercial cloud-based solutions(Keller & Aplin, 2026).

Accountability and transparency are equally crucial. AI support for review writing or editorial decision-making that is not revealed might obfuscate accountability and distort the source of reviewer remarks. Evidence now available is in favour of publisher rules that clearly define permitted AI use, disclosure of meaningful AI assistance, and the preservation of final accountability by human reviewers and editors (Huang et al., 2026). In order to support fair publication practices, diversified training data, continuous performance monitoring, and recurring bias audits are essential. AI systems may potentially reinforce prejudices based on language, region, or institutional reputation (“AI and Peer Review,” n.d.).

Additional issues with intellectual property, originality, and accountability are raised by generative AI, and journal policies pertaining to its application are still inconsistent. A human-in-the-loop governance system, according to recent assessments, would allow AI to assist with technical and administrative duties while maintaining human control over scientific interpretation, ethical assessment, and publication decisions. To enable responsible incorporation of AI into peer review, such frameworks should include explainable AI,

safe data governance, frequent validation, and defined editorial rules ("AI and Peer Review," n.d.).

STAKEHOLDER PERSPECTIVES ON AI-ASSISTED PEER REVIEW

Recent international surveys show that critics are becoming more accepting of AI. According to a global survey by IOP Publishing, about one-third of reviewers had already used AI in some way during peer review, mostly for summarizing, increasing the clarity of reviewer reports, and refining language rather than assessing scientific merit ("AI and Peer Review 2025," n.d.). In a similar vein, a global survey conducted by Frontiers Media with over 1,600 researchers revealed that more than half of reviewers used AI. The majority of respondents thought AI was useful for increasing productivity, but they emphasized that expert reviewers should still make publication decisions (Scuderi et al., 2026).

Qualitative interviews also show that reviewers consider AI more as a tool for productivity than as a substitute for scientific knowledge. According to Ebadi et al., reviewers valued AI-assisted screening, language editing, and plagiarism detection, but they repeatedly stressed that AI is unable to sufficiently evaluate originality, creativity, methodological innovation, or wider scientific relevance (Ebadi et al., 2025). These results imply widespread acceptance from stakeholders for AI as an assistive tool as long as suitable security measures, openness, and human oversight are upheld.

As the main decision-makers in peer review, editors typically see AI solutions as helpful for handling growing submission volumes and enhancing workflow effectiveness. Editors stress the need for open, understandable methods that complement editorial judgment rather than replace it, but they also voice worries about an excessive dependence on algorithmic recommendations (Doskaliuk et al., 2025). Although they are indirect users of AI-assisted review, authors are greatly impacted by its use; they may gain from quicker decisions and more organized comments, but they are concerned about the anonymity of unpublished work and opaque AI-driven judgments (Lee et al., 2026). Significantly, these viewpoints differ according to field, career level, and geographic location, underscoring the necessity of inclusive policy creation that takes into account the requirements of various stakeholders.

FUTURE DIRECTIONS AND EMERGING MODELS OF AI-ASSISTED PEER REVIEW

The creation of hybrid human-AI peer-review systems as opposed to entirely automated review models is becoming more and more supported by recent empirical data. Comparative studies consistently show that AI performs well in technical consistency checks, structured review generation, reporting-guideline assessment, and manuscript summarization, but it is still significantly less reliable for assessing novelty, methodological innovation, and publication suitability (Yang et al., 2026) (Fuente-Ballesteros & Zuin Zeidler, 2026). Therefore, rather than taking the role of expert reviewers, future AI systems should be built to support them.

The creation of strict evaluation frameworks for AI-assisted peer review is a significant research goal. Because highly structured review reports may not always correlate to accurate editorial judgments, recent benchmarking studies have shown that traditional quality criteria may exaggerate AI performance (Idahl & Ahmadi, 2025) (Garg et al., 2025). Therefore, rather than focusing only on language quality, future research should assess AI using clinically and editorially significant outcomes such reviewer agreement, decision accuracy, reproducibility, fairness, manuscript quality after revision, and long-term publication effect.

Additionally, large multicentric prospective studies carried out inside standard editorial workflows are required. Pilot studies, simulated peer-review activities, conference databases, and reviewer questionnaires are the main sources of current evidence. Future studies should assess cost-effectiveness, reviewer workload, editorial efficiency, research integrity, and stakeholder trust while comparing AI-assisted and traditional peer review across various disciplines, journals, and publication models. The ethical application of AI in scholarly publication will be made easier by the creation of globally recognized reporting standards and validation frameworks.

CONCLUSION

By increasing efficiency, lessening the workload for reviewers, and enhancing the identification of ethical and technological problems, artificial intelligence is gradually changing peer review. AI can help editors and reviewers handle increasing submission quantities while preserving research quality when used appropriately. But there are still issues with prejudice, accountability, transparency, and AI's limited capacity to evaluate scientific originality and contextual importance. As a result, AI should be viewed as an assisting tool in a peer review system that is mostly run by humans, where expert judgment is still crucial.

Despite quick progress, there is still little solid data on how AI will affect editorial judgment, impartiality, and peer review quality in the long run. Longitudinal assessments, discipline-specific validation of AI tools, controlled comparisons of AI-assisted and traditional peer review, and standardized metrics for evaluating peer review performance should all be part of future study. By addressing these issues, scholarly publishing's

reputation, integrity, and equity will be maintained while AI is responsibly integrated.

Acknowledgment
The authors would like to thank AIIMS Deoghar for providing institutional support for this work.
Funding
This study did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.
Conflict of interest
The authors declare that there is no conflict of interest regarding the publication of this manuscript.

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How to cite this article: Dr. Anupkumar D. Dhanvijay, Dr. Nitin B. Dhokane, Dr. Mohammed Jaffer Pinjar, Dr. Anita Kumari, Dr. Nikhil Kumar, Dr. Sukrita, ARTIFICIAL INTELLIGENCE-ASSISTED PEER REVIEW: A NARRATIVE REVIEW OF CURRENT EVIDENCE, APPLICATIONS, CHALLENGES, AND FUTURE PERSPECTIVES, Asian J. Med. Res. Health Sci., 2026; 4 (3):13-23.
Source of Support: Nil, Conflicts of Interest: None declared.