International Journal of Pharmaceuticals and Health care Research (IJPHR)

IJPHR |Vol.13 | Issue 3 | Jul - Sept -2025

www.ijphr.com

ISSN: 2306-6091

DOI : https://doi.org/10.61096/ijphr.v13.iss3.2025.387-390

Review

AI Tools and the Evolution in Medical Writing

Praveen Routhu[1*] Rathandeep Latchireddy[1], Girish Kombathula[1], Satish Kumar Vemavarapu[2]

[1]Intern, Clinoxy Solutions Pvt., Ltd., KPHB 9TH Phase, Kukatpally, Back Side Nexus Mall (Forum Mall), Near JNTUH University. Hyderabad. Telangana. 500085
[2]Founder and CEO, Clinoxy Solutions Pvt., Ltd., KPHB 9th Phase, Kukatpally, Back Side Nexus Mall (Forum Mall), Near JNTUH University. Hyderabad. Telangana. 500085

*Author for Correspondence: Praveen Routhu
Email: praveenrouthu2002@gmail.com

Published on: 18 Aug 2025

Published by:
Futuristic Publications

Abstract

Medical writing takes complicated scientific and clinical information and turns it into clear, organised documents that can be read by wide range of people, such as healthcare professionals, regulatory bodies, and the general public. It has its roots in ancient manuscripts and has changed over time as scientific publishing has grown. Medical writers today write regulatory submissions, research article, and educational materials. They are very important for good communication and compliance in the medical and pharmaceutical industries. Artificial intelligence is reshaping health care communication at an unprecedented pace. AI- powered Chabot and language models simplify complex medical information, boost patient engagement, and offer personalized responses, improving understanding and compliance. Healthcare organizations are increasingly adopting AI for patient conversation, reporting faster resolutions, higher satisfaction, and fewer complaints. As Ai continuous to evolve, it empowers healthcare providers and patients alike, making communication more accessible, efficient, and tailored to individual needs. The review examine how artificial intelligence is shaping medical writing It examines how AI technologies-ranging from natural language processing (NLP) models and machine learning writing, including literature review, data interpretation, manuscript drafting, and regulatory documentation. The review covers the integration of AI in both academic and industry and quality assurance measures. Special emphasis is place on the evolving role of the medical writer in the era of AI, the discussion highlights the potential for human - AI collaboration, and outlines future directions for its responsible implementation in clinical and scientific communication.

Keywords: Medical writing, scientific information, regulatory submission, artificial intelligence, healthcare communication, patient engagement, natural language processing, machine learning, human -AI collaboration

INTRODUCTION

Artificial intelligence (AI) refers to the science and engineering of developing intelligent machines, particularly computer programs capable of stimulating human like intelligence, While AI is closely associated with understanding human cognition. With the growing of ChatGPT and other AI tools into nearly every aspect of social and professional life, there is mounting excitement around their potential to tackle complex challenges in transforming various aspects of health care, from enhancing diagnostic precession to facilitating drug discovery. Artificial intelligence is a not a single technology, but rather a collection of interconnected fields, including machine learning (ML), neural networks, and natural language processing (NLP). Machine Learning focus on developing algorithms that learn from data and continuously enhance their performance over time. As noted by rind, student researchers a range of challenges, such as selecting appropriate limited research, private data, reduced human limitations. Natural Language Processing is a discipline at the intersection of computer science, linguistics, and machine learning (ML) focused on teaching computers to interpret understand, and manipulate human language. Despite rapid technological advancements in the 21st century AI by medical student researchers. Critics argue that AI may undermine the creativity of young researchers[1].Machine generated content as an easy alternative, while others believe it simply supports and enhance the research process.

In recent years, a variety of AI applications have emerged to assist researchers-especially early-career scientist in streaming task like literature reviews, formulating research questions, synthesizing evidence difficulties in data collection and interpretation. AI tools and algorithms can help address many of these concern remain data security, reduced human interaction and limitations in accuracy and reliability.

Artificial intelligence tools & the algorithms have been broadly categorized for application in medical research into the several functions areas: Literature search, Literature mapping, Reference management, Manuscript writing and finalization, and collaborative workflows. In the domain of literature searching, a range of AI- powered platforms have emerged, designed to systematically scan and exact data from vast repositories of scientific publications. These tools help streamline the identification of pertinent studies by leveraging algorithms capable of contextual understanding, thereby enhancing the precision and relevance of search results. Features such as named the entity recognition, dynamic query refinement, and automated indexing enable concise summarization and efficient storage of relevant articles, significantly easing the initial phase of literature reviews.

Among the numerous multidisciplinary AI-integrated databases, three prominent platforms stand out for their distinct functionalities.

The medical writer sector also involved in regulatory affairs which deals the approval of drugs and medical services in ensures required scientific regulatory authorities FDA, EMA, and CDSCO it has more efficient integration risk management plans to ensuring the consistency large submissions it changes the regulatory adopting documentation.

It provides health focus in public to evaluate accurate and accessible content it summarizes disease prevention, policy briefs, reports of patients. AI also helps in analyses the data sets from public to primary health care sectors it is more efficient and language signification and lingual content.

PubMed: The PubMed is a widely used, open access platform housing over 36 million citations and abstracts in the field of biomedical research. It cores field of biomedical research. It MEDLINE (Medical Literature Analysis and Retrieval System), includes curated citations from peer-reviewed journals and articles arranged tagged with Medical Subject Headings (MeSH) feature for improved result prioritization and algorithms that analyse user engagement to recommend related articles.

Scopus created by Elsevier, is an extensive multidisciplinary database that indexes peer- reviewed journals, books, and conference proceedings across multiple disciplines. It incorporates AI to optimize search functionality, citation tracking, and research impact assessment. Scopus also offers a free-access preview tool that provides insights into the platforms source-level metrics, even for non-subscribers.

AI tools & the evolution in medical writing

Embase: It is a highly efficient database in which we can conduct systematic literature reviews using a tailored PICO (population, intervention, control, and outcomes) method in a search. It provides access to the relevant information from trusted sources. It has full indexing with the entrée thesaurus[2]. It is a paid and expensive database that is unavailable in many institutions.

Artificial intelligence is healthcare communication that increases the efficacy and health research and highlighting the dual role to enhance the crucial elements and AI driven literature review tools summarization and medical documentation this deals into practical applications of AI of lower extremity and ischemic leg ulcers. It balancing the integration to improve both high-quality and research-focused content.

It assists the patient's information and regulatory documents research in clinical reports. It also reduces the human errors to make the quality documentation which is easy to accessible to the patients and the general

public. AI plays a vital role in medical writing to improve the medical information is created and understood it improves the medical implementation and health care outcomes. The AI promotes to translation and communication to different countries to different languages which is easy to accessible. By simplifying the complex information of patient health plays crucial role to medication guides it assist pharmacist researchers and regulatory teams, clinical study report to know the patient's health care data

Major Applications of AI in Medical Writing

Automated Content Generation: AI tool generates drafts of clinical study reports, protocols, plain language summaries, and publications by synthesizing data from large clinical databases and literature.

Literature Review & Summarization: AI can swiftly scan thousands of research papers, extracting and summarizing data for evidence-based writing, markedly reducing the time for systematic reviews.

Organizing & formatting: Automated organization and forming ensure that documents comply with regulatory or publication standards[3].

Language & Readability Optimization: AI tailor's language complexity, translating technical jargon into patient-or public-friendly summaries and adjusting for specific audiences.

Data Visualization: AI generates tables, figures, and images from raw databases for easier interpretation and communication.

Quality control: AI-assisted tools check for grammatical errors, consistency, plagiarism, and formatting issues, streamlining review cycles and boosting precision.

Reference Management: Advanced tools recommend, verify, and format references automatically, rather than relying on manual cross-checking[4].

Medical writing in biotechnology

Its preparation of regulatory educational documents in biotech to research and product to clearly and accurately. In these field most of the clinical researchers, medical writer's regulatory teams produce the key documents it includes the technologies like patent filling investigator broachers and gene therapies.AI generally used for the public health care and their presentation it helps to treatment and adjusts to the market which provides efficiently and effectively[8]. Biotechnology provides biotechnical research knowledge which summarizing the data and checking complaints from the other sectors ultimately it has the crucial role of a patient health and safety. It provides the information about genetic engineering RNA based information and antibodies development it requires documentation for internal use and skilled medical writers in regulatory submission.

Challenges and drawbacks

Lack of Human Context & judgement: AI lacks nuanced understanding, critical thinking, creativity, and empathy crucial for complex medical communication and ethical decision making.

Dependence on Data Quality: AI-generated output is only as reliable as the input data, errors, outdated information, or bias in source material will propagate into documents[5].

Job Displacement & deskilling: Over -reliance on AI can reduce opportunities for human writers and threaten skill development, especially in routine writing tasks.

Ethical Issues and Authorship: Issues arises regarding proper attribution, originality, data privacy, manipulation, and the risk of "hallucinations" (AI-fabricated content or references).

Standardization vs creativity: while AI promotes standardization, overuse may homogenize writing style, threaten originality, and undermine the richness of scientific communication[6].

Regulatory Compliance Risks: Regulatory agencies currently require expert human review; AI alone cannot ensure regulatory documents are fully accurate or appropriate.

Potential for Misuse: Unchecked use of AI could facilitate the production of low-quality or deceptive scientific papers, undermining public trust and scientific credibility[7].

CONCLUSION

Artificial intelligence (AI) is transforming medical writing to enhancing accuracy, consistency across various documentation processes. AI tools helps streamline workflows, reduce human error, and support evidence-based writing. While AI cannot replace the critical thinking and clinical judgement of medical professionals, it serves as a valuable assistant, enabling writers to focus on higher-level analysis and interpretation. With responsible use and ethical oversight to the quality and speed of medical communications. From literature reviews to regulatory submissions.

REFERENCES

1. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Parisis+N.+Medical+writing+in+the+era+of+artificial+intelligence.+Medical+Writing.2019+Dec1%3B28%284%29%3A4-9.&btnG=
2. https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=2.%09Jhajj+KS%2C+Jindal+P%2C+Kaur+K.+Use+of+artificial+intelligence+tools+for+research+by+medical+students%3B+a+narrative+review.+Cureus.2024+Mar1%3B16%283%29.&btnG=
3. https://pubmed.ncbi.nlm.nih.gov/37806782/.
4. https://www.sciencedirect.com/science/article/pii/S2590291125000269.
5. https://onlinelibrary.wiley.com/doi/full/10.1002/hsr2.70489
6. https://assets.cureus.com/uploads/editorial/pdf/172123/20230909-12719-106xv2n.pdf.
7. https://journals.sagepub.com/doi/abs/10.1177/15347346241312814
8. https://portlandpress.com/emergtoplifesci/article/4/6/551/227204/Biotechnology- nanotechnology-and-medicine