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A STUDY TO ASSESS THE USAGE OF ARTIFICIAL INTELLIGENCE TOOLS FOR MANUSCRIPT WRITING AMONG MEDICAL PROFESSIONALS – A CROSS-SECTIONAL STUDY

Sagar Chidanand Duganavar[1*], Ajay Sajjanar[2], Atyanth B Hallikar[3], Jagadishchandra S Ratnakar[4], Manjunath Kamble[5]

[1*]Post graduate, Department of Pharmacology, BIMS, Belagavi, Karnataka, India
[2]Senior resident, Department of Community Medicine, SNMC, Bagalkot, Karnataka, India
[3]Intern, BIMS, Belagavi, Karnataka, India
[4]Assistant Professor, Department of Pharmacology, BIMS, Belagavi, Karnataka, India
[5]Assistant Professor, Department of Community Medicine, BIMS, Belagavi, Karnataka, India

***Corresponding Author:** Sagar Chidanand Duganavar
*Department of Pharmacology, Belagavi Institute of Medical Sciences, Belagavi, Karnataka, India – 590001, Mob: +91- 8884324548, E-mail – sagarcd100@gmail.com

Abstract

Background: Artificial intelligence (AI) refers to computer systems capable of performing complex tasks that were previously only possible for humans. AI's importance is growing in the healthcare sector. In manuscripts AI can be utilized for paraphrasing, generating information, plagiarism checks, Summarizing Long Medical Studies and Translation.

Methods: After obtaining clearance from the Institutional Ethical Committee, a cross-sectional study was conducted. A Google Form link was sent to medical professionals. Google Forms consist of various information, which includes demographic details, job titles, and specifics regarding the usage of AI tools. Data was analysed using SPSS.

Results: Among 82 responses 54%were females and 46% were males. 40% of participants used AI. For paraphrasing Chat GPT (58%) was used followed by Quillbot (55%). For literature search, Semantic-Scholar (30%) and Connected Papers (30%) were used. For generating information ChatGPT (55%) was used more followed by Co-pilot. For reference management, Zotero (39%) was used more followed by Mendeley (33%). For plagiarism check quillbot (39%) and Grammarly (33%) were popular. To summarize article (63%) didn't use AI, still, ChatGPT, Claude AI, and copilot were used. For finding the grammatical and typing errors Grammarly (49%) and Chat GPT (9%) were used.

Conclusions: AI tools could significantly enhance the quality of academic manuscripts, reducing the time researchers spend on these tasks.

Keywords: Artificial Intelligence (AI), Manuscript writing, Medical writing, Article writing

Introduction

Artificial intelligence (AI) is a broad field of computer science that focuses on developing systems capable of performing tasks that would normally require human intelligence. These tasks include, but are not limited to, understanding natural language, recognizing patterns and images, making complex data-driven decisions, learning from experience, and adapting to new situations. AI systems are intended to mimic cognitive processes like learning and problem-solving. They can be programmed

to improve over time using machine learning algorithms, which allow them to analyse data, identify patterns, and make predictions or decisions with little human intervention. [1,2]

AI applications are diverse and can be found in a variety of industries, including healthcare, where they help diagnose diseases; finance, where they forecast stock market trends; automotive technology, where they enable self-driving cars; and customer service, where they power chatbots that provide assistance. AI's importance in healthcare is most evident in its application to medical images such as biopsy images, magnetic resonance imaging (MRI), computed tomography (CT), and electrocardiography (ECG). AI improves the sensitivity, specificity, and speed of medical diagnoses, marking a turning point in healthcare practices. [3,4]

There is significant potential for the revolutionary impact of artificial intelligence (AI) on the field of medical writing. In manuscripts AI can be utilized for paraphrasing, generating information, plagiarism checks, Summarizing Long Medical Studies and Translation. Currently, there is a noticeable absence of studies examining the utilization of AI tools in manuscript writing among medical professionals. So, we are conducting a study to assess the usage of different AI tools for manuscript writing among medical professionals. [5,6]

Materials and Methods

This questionnaire-based cross-sectional study was conducted after obtaining clearance from the Institutional Ethical Committee. Medical graduates (MBBS) who have completed or currently pursuing post-graduation were included in the study. The study was conducted from March 2024 to April 2024.

A predestined questionnaire was sent via Google form link to medical professionals who were requested to fill the form. It included demographics, job details and other specifics regarding the usage of AI tools for manuscript writing. The data collected was compiled in Microsoft Excel. Statistical analysis was done using IBM SPSS software version 25. Data was expressed in tables, and graphs and the Chi-square test was applied as a test of significance with P-value < 0.05 as statistically significant.

Results

Among 82 participants who were included in the study 44 (53.7%) were females and 38 (46.3%) were males. 57% of the participants were in the age group of 21-30 years (27.7 ± 1.5), and 31.4% were in the age group of 31-40, which covers 88% of the participants. Among the participants, Post Graduate students were 56(67.5%) followed by senior residents11(13.3%). There were no participants who were only Practitioners as shown in table 1.

Among 82 participants 33(40.2%) used AI for manuscript writing, 49 (59.8%) didn't use AI for manuscript writing. Table 2 shows the association of Usage of AI tools for manuscript writing with various variables. There was no association of usage of AI tools with Age, Gender, Designation and Number of publications, though there was near statistical significance for age with p-value of 0.07.

Table 3 show the percentage of different AI tools used for different purposes of manuscript writing. Participants used AI tools for generating information, paraphrasing, grammatical and typing errors, summarizing articles, reference management, plagiarism check, and literature search in manuscript writing. Chat GPT is AI tool which is preferred for different purposes like generating information, paraphrasing, grammatical and typing errors, for summarizing articles. Most number of the participants used AI for paraphrasing followed by finding grammatical and typing errors and reference management. AI was least used for summarizing articles.

Table 1: Demographic characteristics and professional designations of study participants

Age group	**N**	**Percentage (%)**
21-30	47	57.3
31-40	27	32.9
41-50	5	6.1
≥51	3	3.7
Total	**82**	**100**
Gender		
Male	38	46.3
Female	44	53.7
Total	**82**	**100**
Designation		
Post Graduate student	56	**67.5**
Senior residents	11	**13.3**
Assistant Professor	3	**3.6**
Associate Professors	8	**9.6**
Professor	5	**6**
Clinical Practice Only	0	**0**
Total	**82**	**100**

Table 2: Association of Usage of AI tools for manuscript writing with various variables

	Usage of AI		**χ^2 value**	**p value**
	Yes N(%)	No N(%)		
Age				
21-30	23 (48.9)	24 (51.1)	6.98	0.07
31-40	10 (37)	17 (63)		
41-50	0 (0)	5 (100)		
≥51	0 (0)	3 (100)		
Total	33 (40)	49 (60)		
Gender			0.102	0.74
Male	16 (42.1)	22 (57.9)		
Female	17 (38.6)	27 (61.4)		
Total	33 (40.2)	49 (59.8)		
Designation			7.71	0.102
Assistant professor	0 (0)	3 (100)		
Associate professor	2 (25)	6 (75)		
Post Graduate student	25 (45.5)	30 (54.5)		
Professor	0 (0)	5 (100)		
Senior Resident	6 (54.5)	5 (45.5)		
Total	33 (40.2)	49 (59.8)		
Number of publications			1.507	0.47
0-5	29 (42)	40 (58)		
6-20	4 (36.4)	7 (63.6)		
>20	0 (0)	2 (100)		
Total	33 (40.2)	49 (59.8)		

*N = 82, χ^2= chi-square test was applied to see the association, p-value <0.05 is considered to be statistically significant

Table 3: Percentage of different AI tools used for different purposes of manuscript writing

	Generating information	Paraphrasing	Grammatical and typing errors	For summarizing articles	plagiarism check	for reference management	literature search
Not used for this	33.3	3	10	64	33	30	49
Chat GPT	54.5	58	9	24	--	--	--
Quill Bot	--	55	--	--	39	--	--
Co-pilot	15.2	--	--	9	--	--	--
Perplexity	3	--	--	--	--	--	--
Gemini	3	3	--	--	--	--	--
Research rabbit	--	3	--	--	--	--	--
Bing	--	3	--	--	--	--	--
Grammarly	--	--	49	---	33	--	--
Claude AI	--	--	--	3	--	--	--
Zotero	--	--	--	--	--	39	--
Meneley		--	--	--	--	33	--
Scite	--	--	--	--	--	12	--
Connected papers	--	--	--	--	--	--	30
Sourcely	--	--	--	--	--	--	12
Schematic Scholar	--	--	--	--	--	--	30

Discussion

Our study showed that 40.2% of the participants used AI tools for manuscript writing. AI tools are being used for generating information, paraphrasing, grammatical and typing errors, summarizing articles, reference management, plagiarism checks, and literature search. For paraphrasing AI tools were used most and Chat GPT is an AI tool that was more popular and used for multiple purposes in manuscript writing.

In studies conducted by L. Benichou and Denver S. Pinto et al., a detailed comparison was made between manuscripts generated by AI and those written by humans. They have used Chat GPT for preparing the manuscript across all sections, including the introduction, results, and discussion. [7,8] In our study, different AI tools were used for writing manuscripts. This shows that there are specific AI tools used for the particular work in manuscript writing. Collectively all these AI tools can be used for drafting introductions, presenting results, crafting discussions, and even for performing tasks such as paraphrasing and correcting grammatical errors. For generating information Chat GPT, for paraphrasing Chat GPT, for grammatical and typing errors Grammarly, for summarising articles Chat GPT, for reference management Zotero, for plagiarism check Quill bot, for literature search connected papers were used most.

In his article, Parisis N says that AI has the potential for a revolutionary impact on the field of medical writing. [4] From the results of our study, we can justify this as AI has been used by 40% of the participants, and it's been used for multiple purposes in manuscript writing and there are specific AI tools for specific works of manuscript writing which is evident in our results. AI tools make manuscript writing easier, save time, and reduce errors, but they can also hinder critical thinking, creativity, and in the future, AI may pose a threat to medical writers. Even though AI can used for manuscript writing but it can only assist humans and save time and errors in manuscripts.

Conclusion

In this study of 82 participants, a diverse group of individuals was surveyed to assess the usage and purpose of AI tools in manuscript writing. A significant portion of the participants were aged between 21 and 40 years (88%) and predominantly comprised postgraduate students (67.5%). The findings indicate that the use of AI tools for manuscript writing is relatively common, with 40.2% of participants reporting that they utilize AI for this purpose.

Among the various AI tools, Chat GPT emerged as the most frequently used tool for multiple purposes, including generating information, paraphrasing, and correcting grammatical and typing errors. Paraphrasing was identified as the most common application of AI tools, followed by usage for correcting grammatical and typing errors, and reference management. However, AI was least used for summarising articles.

In conclusion, the widespread use of AI tools could significantly enhance the quality of academic manuscripts, reducing the time researchers spend on these tasks.

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