

Free software applications for authors for writing a research paper

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ABSTRACT

Basic computer skills are essential for authors writing research papers as it has the potential to make the task easier for a researcher. This article provides a glimpse about the essential software programs for a novice author writing a research paper. These software applications help streamline the writing process, improve the quality of work, and ensure that papers are formatted correctly. It covers word processing software, grammar correction software, bibliography management software, paraphrasing tool, writing tools, and statistical software. All of the tools described are free to use. Hence, it would help researchers from resource-limited settings or busy physicians who get lesser time for research writing. We presume this review paper would help provide valuable insights and guidance for novice authors looking to write a high-quality research paper.

Keywords: Authors, computer skills, grammar correction, novice author, paraphrasing tool, research papers, software programs, statistical software, word processing, writing

Introduction

An author is one who “writes a book, article, play, etc.” A researcher is “someone whose job is to study a subject carefully, especially in order to discover new information or understand the subject better.” However, in a broad sense, a researcher is an author first. In a research cycle, a researcher needs to become an author from the very beginning of the research (preparation of proposal) to the end of the research (writing a paper for publication).^[1]

Basic computer skills are essential for authors writing research papers because computers and technology have become a

fundamental part of the research and writing process. As a new author writing a research paper, there are several essential software skills that can help you streamline the writing process, improve the quality of work, and ensure that the proposal or paper is formatted correctly.^[2] However, these skills are rarely taught in our formal undergraduate or postgraduate course of study.

In this context, we discuss some of the basic software skills that may enhance the the quality of an research article in this article. This includes word processing software, grammar-checking software, paraphrasing tools, statistical software, writing tools, and keyword-searching tool.

Software applications

We describe some of the free software applications that may help authors during the preparation of a research paper. All the applications described are available either for computers or can

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be used online without paying any fees. Relevant websites where the tools are available are shown in Table 1.

Computer software applications

OpenOffice

Apache OpenOffice is a free and open-source office software suite that includes a word processor (writer), spreadsheet, presentation software, and other tools. OpenOffice Writer is similar to Microsoft Word and can be used to write and format your research article.^[3] This program is capable of saving the file into its own format (.odt) and also helps in saving the file in Microsoft Word document format (.doc). Hence, any text typed in this program can easily be opened with Microsoft Word. Along with typing an article, this program can help in making a flow chart (e.g. PRISMA flow chart for systemic review and meta-analysis) for research articles. Figure 1 shows the user interface of OpenOffice writer.

Table 1: Software application (downloadable and online) with websites and their primary use for research purposes

| Title | Website | Meant for |
|-------------------|---|--|
| Apache OpenOffice | https://www.openoffice.org | Typing, Basic statistics, Presentation |
| WPS office | https://www.wps.com/download | Typing, Basic statistics, Presentation |
| JAMOVI | https://www.jamovi.org | Statistical analysis |
| ZOTERO | https://www.zotero.org | Bibliography or reference management |
| Google Drive | https://www.google.com/drive/download | Cloud storage to save important files |
| Grammarly | https://app.grammarly.com | Correcting grammar and presentation |
| QuillBot | https://quillbot.com | Paraphrasing to avoid plagiarism |
| MeSH on Demand | https://meshb-prev.nlm.nih.gov/MeSHonDemand | Finding MeSH terms in an article |
| DOI | https://www.doi.org | Article discovery and correct citation of ahead of print article |
| JANE | https://jane.biosemantics.org | Searching related article or author or journal |
| ChatGPT | https://chat.openai.com | Writing assistance for any research article |
| Bard | https://bard.google.com | Writing assistance for any research article |

WPS=Writer, Presentation and Spreadsheets, MeSH=Medical Subject Headings, DOI=Digital Object Identifier, JANE=Journal/Author Name Estimator, GPT=Generative Pre-training Transformer

There is alternative office software called WPS (an acronym for Writer, Presentation, and Spreadsheets) office. Its personal basic version is free to use. However, the full version needs a subscription. Hence, researchers who are not comfortable with OpenOffice can use this software for writing their papers.

JAMOVI

JAMOVI is open-source software for statistical analysis, which means that it is free to download and use. This can be particularly useful for researchers on a budget who do not have access to expensive commercial software. JAMOVI has a user-friendly interface that is easy to navigate, even for beginners. JAMOVI offers a wide range of statistical analyses, including t-tests, ANOVA, regression, and factor analysis. It is particularly well suited for researchers who need to conduct statistical analyses but are not familiar with the more complex features of traditional statistical software like Statistical Package for the Social Sciences (SPSS).^[4] Figure 2 shows a part of the software when we conducted a Wilcoxon signed rank test (the nonparametric equivalent of paired *t*-test).

Those who are not interested to learn the basics of the JAMOVI can refer to the “online statistics” section of this article where we provided some websites that help in conducting basic statistical tests.

Zotero

Zotero allows researchers to collect and organize references from a variety of sources, including library catalogs, websites, and databases. This can help researchers keep track of their sources and ensure that they have all the necessary information to cite them correctly. Zotero allows users to store full-text articles as PDFs, web pages, or other formats, along with their corresponding bibliographic information. This can make it easier to access articles and ensure that the information is all in one place. Zotero makes it easy to create bibliographies in a variety of formats, including APA, MLA, Chicago, and many others. This can save researchers time and reduce the likelihood of errors.^[5]

However, those who are not willing to manage the references by Zotero can simply use the comment option in the word processing software to easily keep the reference with the text, and after the final draft, copy those references to add them to the manuscript file.

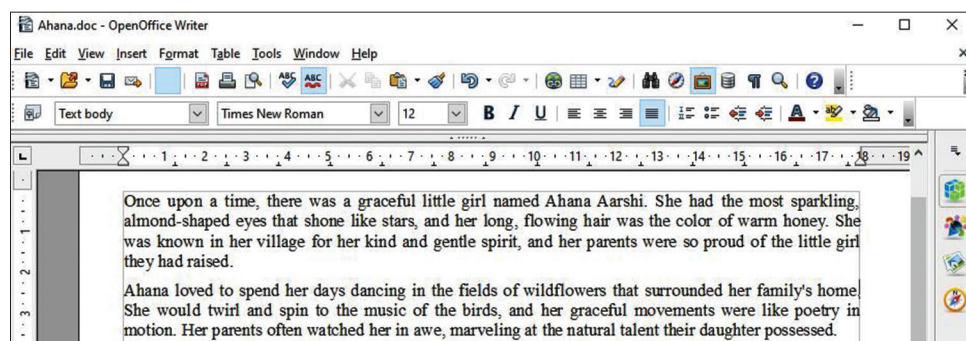


Figure 1: A portion of a story written on OpenOffice Writer showing the user interface

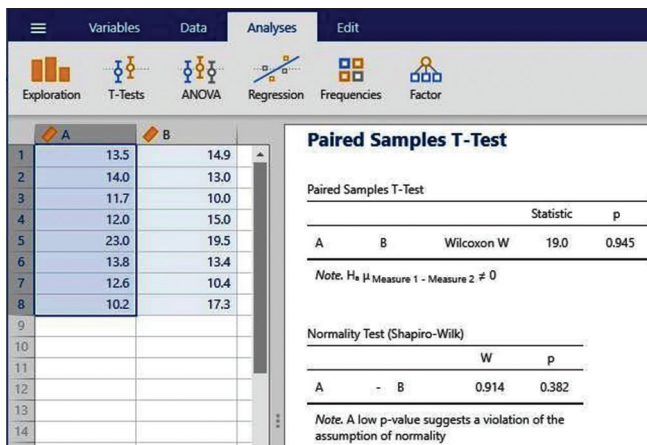


Figure 2: Part of the application JAMOVI when a Wilcoxon signed rank test was conducted

Google drive

Google Drive is a cloud-based storage and collaboration tool that can be very useful for researchers. Google Drive allows researchers to access their work from any device with an internet connection, making it easy to work on the go and collaborate with others from anywhere in the world. Google Drive makes it easy for researchers to collaborate with colleagues by sharing documents, spreadsheets, and presentations in real time. Multiple users can work on the same document simultaneously, and changes are saved automatically. Google Drive allows researchers to organize their research materials and data in one place, making it easy to find and access them when needed. By storing research materials and data on Google Drive, researchers can ensure that their work is backed up and secure, reducing the risk of data loss due to hardware failure or other issues.^[6] The drive application can be downloaded and installed [Table 1] on computers that would create a separate drive in the computer and keeping any files in this folder would be synchronized online and you can access it from any device connected to the Internet. However, it is to remember that an account is provided free with 15 GB of free cloud storage.

Online software applications

Grammarly

Grammarly is an online grammar-checking tool that can be very helpful for writers who want to improve the accuracy and clarity of their writing. It uses advanced algorithms and artificial intelligence to analyze text and identify errors in grammar, spelling, and punctuation. In addition to catching grammar and punctuation errors, Grammarly can also suggest vocabulary enhancements improve the style and tone of your writing. This can help you avoid common writing mistakes and create more engaging content. When Grammarly identifies an error in your writing, it explains the rule that you may have violated and suggests corrections that you can make. This can help you learn from your mistakes and avoid making similar errors in the future.^[7] A guide on how to use Grammarly is available elsewhere in the article by Mondal and Mondal.^[8] The premium

version of the software provides further enhancement of the article. However, the basic free version helps a lot in correcting grammar that is skipped by common word processing software.

Quillbot

Quillbot is a paraphrasing tool that uses advanced algorithms and artificial intelligence to help researchers rephrase and reword their writing. It can be very helpful for researchers who need to paraphrase content for academic or professional purposes. Quillbot can help researchers save time by automatically rephrasing and rewording content. This can be particularly useful for researchers who need to paraphrase large amounts of text or who are working under tight deadlines. Quillbot can help researchers avoid text similarity (i.e. text plagiarism) by providing a way to paraphrase the content. This can be important for researchers who need to avoid plagiarism in their academic or professional work. Quillbot can be used on a variety of platforms, including web browsers, mobile devices, and desktop applications. This makes it easy to use Quillbot on the platform of your choice and to access your writing from multiple devices.^[8] Figure 3 shows an example where a paragraph of text is being paraphrased.

MeSH on demand

MeSH on Demand is a website that provides a user-friendly interface to create Medical Subject Headings (MeSH) terms, which are widely used in the biomedical literature to facilitate the indexing and retrieval of articles. It can be very useful for researchers who need to identify appropriate MeSH terms for their research articles. It generates keywords and phrases related to the text provided by the user. This can be very helpful for researchers who are unfamiliar with the MeSH vocabulary and want to ensure that their articles are indexed correctly.^[9] Figure 4 shows searching MeSH terms in a paragraph of text. After getting the MeSH terms, the author needs to decide which are the most relevant keywords for their manuscript and use those. The majority of the journal has a limitation on the number of keywords.

In addition to searching MeSH terms in an article, the search result also includes relevant articles available in PubMed. Authors can check the list if they had missed any relevant literature.

DOI

DOI stands for Digital Object Identifier, which is a unique identifier assigned to a digital object such as a research article, data set, or other types of research output. It is widely used in the scholarly publishing industry and can be very useful for researchers. Researchers can always locate and access the digital object with DOI. It also helps researchers accurately cite their sources by providing a unique identifier that can be included in the reference list. This can help ensure that the citation is accurate and can be easily located by copy editors or readers.^[10] In many journals, DOI is printed as a quick response code in the printed version of the journal so that any reader can scan it and get the article online. During writing an article, authors may

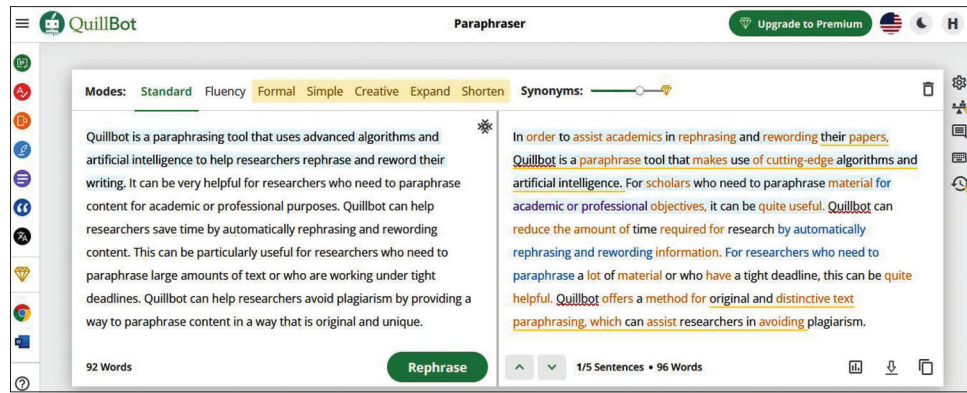


Figure 3: A paragraph of text is paraphrased by QuillBot

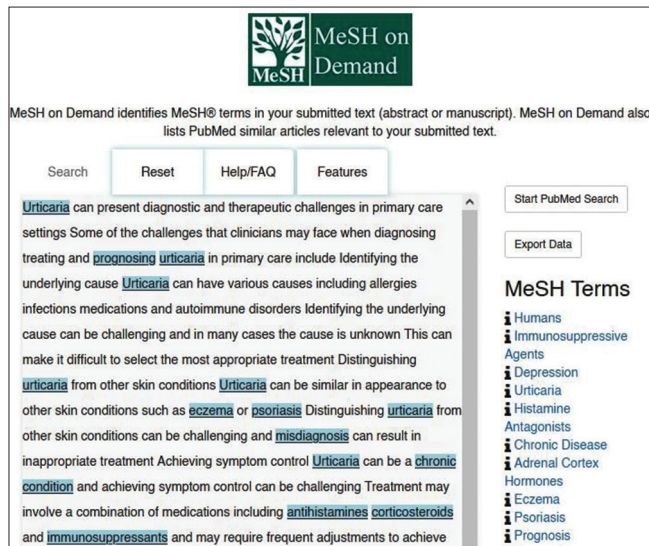


Figure 4: MeSH terms were searched from a paragraph of text on MeSH on Demand web application

save the DOI number along with the reference for a quick access of the article in future. However, authors always need to check the DOI before putting it along with references as sometimes, due to technical problems, the DOI does not work. In that case, they can save the URL of the article for accessing the paper later.

JANE

JANE stands for Journal/Author Name Estimator, which is a Web-based application designed to help researchers find relevant journals and authors for their research. JANE is a free service provided by the Biosemantics Group and funded by Netherlands Bioinformatics Centre, which makes it an accessible and cost-effective tool for researchers. JANE can help researchers find relevant journals for their research by analyzing the title and abstract of their paper and comparing it to the content of thousands of journals. This can save researchers time and effort in identifying appropriate journals to submit their work. JANE can also help researchers identify potential collaborators for their research by analyzing the authors of the papers in the relevant journals. This can help researchers find other experts in their field who are working

on similar research topics.^[11] From the list, authors can get email address of the authors and can use those for suggesting reviewers for the article, if the journal wants some suggested peer reviewer. In Figure 5, three buttons are shown for finding “journals,” “authors,” and “articles.”

Online statistics

There are several online free websites that provide statistical tests for researchers. These online free websites can be helpful for researchers who need to conduct statistical tests but may not have access to specialized software or support. They provide a range of statistical tests and tools that are user-friendly and can be accessed from any device with an internet connection. Table 2 is showing some of the websites. Furthermore, detailed guidelines along with practice materials are available in articles by Mondal *et al.*^[12-15]

AI writer

There is several artificial intelligence (AI)-based writing assistance software available. In recent times, an AI language model, ChatGPT is in discussion among academicians due to its human-like conversational and writing capability. It can be a useful tool for researchers in the process of writing a research paper. Researchers can use ChatGPT to generate ideas and inspiration for their research paper by inputting a topic or question related to their research. ChatGPT can then generate relevant sentences or paragraphs that can serve as a starting point for the paper. Researchers can use ChatGPT to help them write more clearly and effectively. This would particularly be helpful for non-native speakers of English. ChatGPT can provide suggestions for improving the wording, grammar, and structure of sentences, and can also provide synonyms or related words to improve the richness of the text. ChatGPT can be used to summarize long passages of text, making it useful for summarizing articles and research papers for review and analysis. ChatGPT can assist researchers in managing their citations and references by generating citations and reference lists in the appropriate format.^[16] However, many a times, ChatGPT generates fictitious references for text which is not found on the internet. Google Bard is an alternative to ChatGPT which can also help in the tasks done by ChatGPT.

An example of conversation with ChatGPT is shown in Figure 6 where the ChatGPT was asked to explain importance of family medicine in India with three references.

Discussion

Overall, having a basic understanding of these software tools can help new authors write more efficiently, effectively, and accurately, and create a professional-looking research paper.

There are several advantages of using technology for writing a research paper. Technology can greatly increase the efficiency of the research paper writing process, enabling researchers to complete tasks faster and more accurately. For example, ChatGPT can write a portion of the manuscript within seconds and QuillBot can help paraphrase text in a very short time. Technology can facilitate collaboration among researchers by enabling them to work together remotely and share information and feedback in real time. Digital tools can help researchers organize their research materials and notes more effectively, making it easier to keep track of important information and sources. In both domains, Google Drive is of great help.^[17,18]

There are some disadvantages to using technology for research. Overreliance on technology can lead to a loss of critical thinking

Table 2: Websites for statistical analysis

| Title | Website |
|------------------------------------|---|
| Statistics Kingdom | https://www.statskingdom.com |
| Social Science Statistics | https://www.socscistatistics.com |
| QuickCalcs—GraphPad | https://www.graphpad.com/quickcalcs |
| Epitools | https://epitools.ausvet.com.au |
| MedCalc | https://www.medcalc.org/calc |
| Online Web Statistical Calculators | https://astatsa.com |
| Meta-calculator | https://www.meta-calculator.com |

This is not a comprehensive list of online calculator

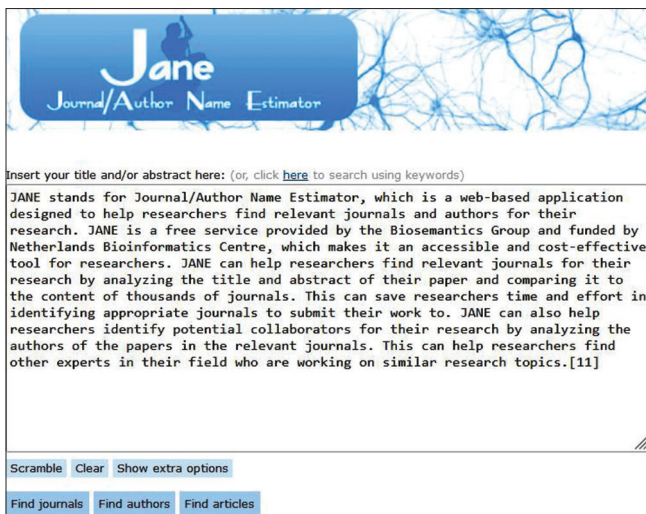


Figure 5: User interface of JANE where text can be pasted or typed and journals, authors, or articles can be searched by pressing buttons below

and writing skills, as well as a reduced ability to solve problems independently. The Internet and other digital tools can be a source of distraction and can hinder concentration and focus, potentially leading to lower-quality research and writing. While the Internet provides access to vast amounts of information, not all of it is reliable or accurate, which can lead to lower-quality research and writing. Not all researchers have access to the necessary technology and resources to complete their research effectively, which can create barriers to entry and hinder research progress.^[19,20]

While we use the software applications for shaping our research paper, should we acknowledge them in the research paper as we mention humans who help us for similar task? Researchers mention the software package details, acknowledge any third party editing services, or copy editing by any human. However, they usually do not acknowledge the software. When it comes to word processing software, such as Microsoft Word or OpenOffice, it is not necessary to acknowledge them in a research paper. These tools are commonly used for writing and formatting documents, and their usage is expected. Regarding specific tools like Grammarly or ChatGPT, if substantial help was obtained, then acknowledging them would be appropriate. However, specific role to be mentioned for which the help was taken.^[21] For example, refer to the acknowledgement part of this manuscript to have a glimpse on how we acknowledged ChatGPT for its help in this manuscript. Similar text can be added when help is taken from other tools.

Overall, technology can greatly benefit the research paper writing process, but researchers need to be aware of its limitations and potential drawbacks. By balancing the advantages and disadvantages of using technology, researchers can use it as a

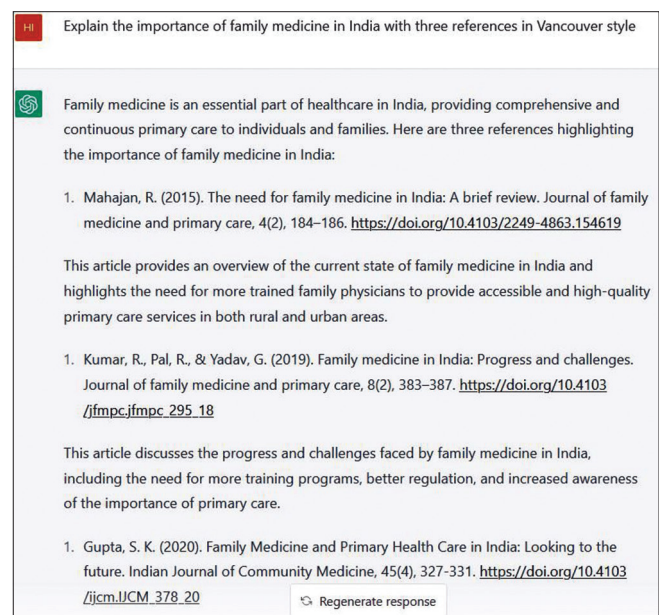


Figure 6: A conversation with ChatGPT showing the input and output

tool to enhance their research and writing while maintaining the integrity and quality of their work. Primary care physicians often engage in research activities; however, busy primary care physicians hardly get time for writing. Hence, these applications can assist them in organizing research data, writing manuscripts, and formatting citations and references.

Conclusion

This review paper has discussed the essential software programs that are highly recommended for novice authors writing a research paper. The software programs discussed include Open Office for typing a paper, Jamovi for statistical analysis, Zotero for reference management, Google drive for data storage and accessibility, Grammarly for checking grammar, QuillBot for paraphrasing, MeSH on demand for searching keywords and related articles, DOI for searching the literature, JANE for author search, various online websites for statistical analysis, and language-based AI for generating content for a research paper. Utilizing these essential software programs and maintaining a balanced approach to technology use, novice authors can produce higher-quality research papers and contribute to the advancement of their respective fields.

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Conflicts of interest

There are no conflicts of interest.

References

- Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. *Qual Health Res* 2005;15:1277-88.
- Levac D, Colquhoun H, O'Brien KK. Scoping studies: Advancing the methodology. *Implement Sci* 2010;5:69.
- Taylor DM, Hodgkinson PW, Khan AS, Simon EL. Research skills and the data spreadsheet: A research primer for low- and middle-income countries. *Afr J Emerg Med* 2020;10(Suppl 2):S140-4.
- Şahin MD, Aybek EC. Jamovi: An easy to use statistical software for the social scientists. *Int J Assess Tool Educ* 2019;6:670-92.
- Ahmed KK, Al Dhubaib BE. Zotero: A bibliographic assistant to researcher. *J Pharmacol Pharmacother* 2011;2:303-5.
- Kubaszewski L, Kaczmarczyk J, Nowakowski A. Management of scientific information with Google Drive. *Pol Orthop Traumatol* 2013;78:213-7.
- Nazari N, Shabbir MS, Setiawan R. Application of Artificial Intelligence powered digital writing assistant in higher education: Randomized controlled trial. *Heliyon* 2021;7:e07014.
- Fitria TN. QuillBot as an online tool: Students' alternative in paraphrasing and rewriting of English writing. *Englisia Journal* 2021;9:183.
- Mondal H, Mondal S, Mondal S. How to choose title and keywords for manuscript according to medical subject headings. *Indian J Vasc Endovasc Surg* 2018;5:141-4.
- Neumann J, Brase J. DataCite and DOI names for research data. *J Comput Aided Mol Des* 2014;28:1035-41. doi: 10.1007/s10822-014-9776-5.
- Curry CL. Journal/Author Name Estimator (JANE). *J Med Libr Assoc* 2019;107:122-4.
- Mondal H, Mondal S, Majumder R, De R. Conduct common statistical tests online. *Indian Dermatol Online J* 2022;13:539-42.
- Mondal H, Swain SM, Mondal S. How to conduct descriptive statistics online: A brief hands-on guide for biomedical researchers. *Indian J Vasc Endovasc Surg* 2022;9:70-6.
- Mondal S, Saha S, Mondal H, De R, Majumder R, Saha K. How to conduct inferential statistics online: A brief hands-on guide for biomedical researchers. *Indian J Vasc Endovasc Surg* 2022;9:54-62.
- Mondal S, Mondal H, Panda R. How to conduct inferential statistics online (Part 2): A brief hands-on guide for biomedical researchers. *Indian J Vasc Endovasc Surg* 2022;9:63-9.
- Biswas S. ChatGPT and the future of medical writing. *Radiology* 2023;307:e223312. doi: 10.1148/radiol.223312.
- Ramírez-Castañeda V. Disadvantages in preparing and publishing scientific papers caused by the dominance of the English language in science: The case of Colombian researchers in biological sciences. *PLoS One* 2020;15:e0238372.
- Kumar PM, Priya NS, Musalaiah S, Nagasree M. Knowing and avoiding plagiarism during scientific writing. *Ann Med Health Sci Res* 2014;4(Suppl 3):S193-8.
- Dontre AJ. The influence of technology on academic distraction: A review. *Hum Behav & Emerg Tech* 2021; 3:379- 90. [DOI for you to check: <https://doi.org/10.1002/hbe2.229>].
- Lang TA, White NJ, Tran HT, Farrar JJ, Day NP, Fitzpatrick R, *et al.* Clinical research in resource-limited settings: enhancing research capacity and working together to make trials less complicated. *PLoS Negl Trop Dis* 2010;4:e619. [DOI for you to check: 10.1371/journal.pntd.0000619].
- Rahimi F, Talebi Bezmín Abadi A. ChatGPT and publication ethics. *Arch Med Res* 2023;54:272-4.