Arab World English Journal
INTERNATIONAL PEER REVIEWED JOURNAL ISSN: 2229-9327

Arab World English Journal (AWEJ) Volume 15. Number 2, June 2024 Pp.144-154
DOI: https://dx.doi.org/10.24093/awej/vol15no2.9

Analysis of English Language Errors in Medical Writing: A Systematic Literature Review

Wei Shen
School of Language Studies and Linguistics
Faculty of Social Sciences and Humanities
Universiti Kebangsaan Malaysia, Selangor, Malaysia
Corresponding Author: P120860@siswa.ukm.edu.my

Afendi Hamat
School of Language Studies and Linguistics
Faculty of Social Sciences and Humanities
Universiti Kebangsaan Malaysia, Selangor, Malaysia

Jun Wang
School of Foreign Studies
Yanshan University, Qinhuangdao, China

Received: 02/13/2024 Accepted:06/06/2024 Published:06/28/2024

Abstract
Effective communication in medical writing is essential for conveying accurate and understandable information to healthcare professionals and patients. English language errors in medical literature can lead to misunderstandings, misinterpretations, and potentially harmful consequences. This systematic literature review aims to identify, analyze, and categorize common English language errors encountered in medical writing. This study identifies gaps in existing literature on language errors in medical writing and reveals areas that need further investigation or where more comprehensive guidelines are required. This study addresses six questions: (1) What types of language errors are discussed in the current literature? (2) What types of medical writing are involved in the current literature? (3) Which countries or areas are involved in the current literature? (4) What are the research methods used in the studies? (5) What tools are used in the studies? (6) What are the limitations of these studies? To answer these questions, this review searched nine databases and one platform, ProQuest Dissertations and Theses Fulltext, ProQuest Ebook Central (e-Books), Scopus, Web of Science, Wiley Online Library (e-Journals & e-Books) (PPV), Science Direct, Cambridge Core e-Books, Oxford Press Scholarship Online (e-Books), Google Scholar, and Carian Bestari@UKM / Discovery Service@UKM. Finally, ten studies were selected, including articles and books. The findings provide insights into types of language errors, types of medical writing, countries or areas of medical writing, research methods, tools, and limitations of these ten studies, highlighting the importance of linguistic accuracy and proficiency in medical writing.

Keywords: English language error, error analysis, healthcare, medicine, medical writing
Cite as: Shen, W., Hamat, A., & Wang, J. (2024). Analysis of English Language Errors in Medical Writing: A Systematic Literature Review. *Arab World English Journal*, *15*(2), 144-154.
DOI: https://dx.doi.org/10.24093/awej/vol15no2.

Introduction

Effective medical writing is vital for announcing discoveries and treatment options while enabling precise documentation of research findings. Medical writing involves a range of document types, each serving unique purposes and targeted toward specific audiences, for example, medical education, medical journalism, medical marketing of healthcare products, publication or presentation, research documents, and regulatory documents (Sharma, 2010). Each type of medical writing targets a specific audience, including medical professionals, patients, the general public, medical sales representatives, and drug regulators. Undoubtedly, no matter who the audience is, the accuracy of the language is essential to convey information clearly to them. English remains widely used in the medical community (Zhang & Wáng, 2015).

Language errors are "unsuccessful bits of language" (James, 2013, p. 1). Language errors typically refer to inaccuracies in the use of language, including grammar, spelling, punctuation, syntax, vocabulary, and so on. These errors can occur in written or spoken communication and may lead to misunderstanding or confusion. In medical writing, language errors can be particularly problematic as they may compromise the clarity, accuracy, and professionalism of the content, which is crucial for effective communication in healthcare settings. English has been the universal language in the medical community since the late twentieth century (Maher, 1986; Ferguson, 2013). The English language is significant in medical learning and presenting research activities internationally (Piroozan, Boushehri & Fazeli, 2016). English language errors may lead to confusion among audiences around the world. Therefore, it is vital to reduce English language errors. Then, it is necessary to analyze them, which means "error analysis" is essential. Brown (2000) defines "error analysis" as the process of observing, analyzing, and categorizing deviations from the rules of second languages to reveal the systems employed by learners. Error Analysis sheds light on the fascinating journey of language acquisition, where errors serve as stepping stones toward linguistic competence. In medical writing, analysis of English language errors can not be skipped to share clear ideas with the audience. Therefore, this systematic literature review aims to review the research on error analysis of the English language in medical writing to identify the common language errors and the gap in the existing literature.

The researcher tried to cover all the studies on the error analysis of the English language in medical writing. The following nine Databases and one platform were searched: ProQuest Dissertations and Theses Fulltext, ProQuest Ebook Central (e-Books), Scopus, Web of Science, Wiley Online Library (e-Journals & e-Books) (PPV), Science Direct, Cambridge Core e-Books, Oxford Press Scholarship Online (e-Books), Google Scholar, and Carian Bestari@UKM / Discovery Service@UKM. The nine databases have been selected because they are well-known and have a wide range of audience. The platform of Carian Bestari@UKM / Discovery Service@UKM was also searched for its extensive book collection. The study aims to fulfill the following specific objectives: (1) to identify the most common types of language errors discussed in the current literature; (2) to identify the most common types of medical writing involved in the current literature; (3) to find out the countries or areas involved in the current literature; (4) to find out the research methods used in the current literature; (5) to find out the tools used in the current literature; (6) to find out the limitation of the studies.

Literature Review

An error, in linguistics, is when a learner employs a word, speech act, or grammatical item in a manner that appears imperfect and suggests incomplete learning (Richards, Schmidt, 2002).

Error analysis in linguistics has been a significant field of study, particularly in the context of second language acquisition. Aybek and Can (2024) use corpus-based error analysis tools to identify English language errors made by EFL learners who took exams such as PET, PETfS, and CAE. Halim, A., and Halim N. M. (2024) pay attention to language errors in the academic writings of EFL students. Khaliq and Abbas (2024) identify the common syntactical errors in undergraduate students' essay writing and assess learners' feedback during the learning process. Pardede, Lustyantie, and Iskandar (2023) analyze the errors identified in undergraduate thesis abstracts by using corpus tools, and find out that the types of errors most frequently committed in the corpus are "grammatical errors, phrasing errors, and punctuation errors" (p. 361). Ahmad, Shahid, and Farhat (2023) conducted a comparative analysis of errors committed by ESL students from two secondary schools, one public and one private, and found that the private school made fewer syntactical errors which shows the importance of the medium of instruction.

However, English language errors in medical writing are not so commonly discussed. It is necessary to discuss the English language errors in medical writing to get to know the current status of medical writing, improve the quality of English writing in the healthcare and medical field, and encourage accurate writing in this field. Some scholars notice this topic. Farrokh Eslamloo, Heidari, and Ayremloo (2021) analyze errors in the published medical papers in Iranian medical English journals. Jirapanakorn (2012) pays attention to error analysis on reporting verbs in published research article introductions in Thai medical journals. To review the research on error analysis of the English language in medical writing to identify the common language errors and the gap in the existing literature, a systematic literature review was conducted.

Methodology

For this systematic literature review, articles or books in online databases were searched: ProQuest Dissertations and Theses Fulltext, ProQuest Ebook Central (e-Books), Scopus, Web of Science, Wiley Online Library (e-Journals & e-Books) (PPV), Science Direct, Cambridge Core e-Books, Oxford Press Scholarship Online (e-Books), and Google Scholar. All the searches are from the earliest date to February 18th, 2024. As for the database of ProQuest Dissertations and Theses Fulltext, it produced 19 related dissertations and theses, but all were excluded according to the inclusion or exclusion criteria. The search of ProQuest Ebook Central produced 7 books, but all were excluded. Scopus produced 16 articles based on the search term, but only one was included based on the inclusion criteria. Web of Science produced 2 articles, but both were excluded. Wiley Online Library (e-Journals & e-Books) (PPV) offers 7 articles, but all were excluded. Science Direct produced 3 research articles, but all were excluded. Cambridge Core e-Books provides 5 articles and books, but all were excluded. Oxford Press Scholarship Online (e-Books) produced 5 books of which one was included based on the inclusion criteria. Google Scholar provides 101 associated articles and books from which finally 7 were included based on inclusion criteria. In total, the 9 databases produced 165 related papers and books. 9 articles and books are included based on the inclusion criteria.

Carian Bestari@UKM / Discovery Service@UKM was also searched. This platform allows users to search across various databases, journals, and other resources available through the UKM library system, providing a convenient way to access a wide range of academic materials for their studies and research. There were 138 records through searching e-Resources (EBSCO Discovery) on the platform of Carian Bestari@UKM / Discovery Service@UKM, from which one book was selected based on the inclusion criteria. No grey literature is found after searching on opengrey.eu/,

opendoar.eu/ , and openaire.eu/.

Overall, there were ten articles and books were included. The search term used was “error analysis” AND “medical writing”. At the screening stage, ‘all text’ were searched not just the title, abstract, or keywords to detect the studies related to error analysis of the English language in medical writing as much as possible. As for the criteria, according to the title and research questions of this review, it is set as follows in table 1.:

Table 1. *Inclusion and exclusion criteria*

The Inclusion Criteria
1. The articles which were related to error analysis were included.
2. The studies that focused on language errors other than other errors were included.
3. The studies that focused on language errors in English language writing were included.
4. The studies that focused on language errors in medical writing were included.
5. The articles that were written in English were included.
The Exclusion Criteria
1. The studies which were not related to error analysis were excluded.
2. The studies that focused on other errors other than language errors were excluded.
3. The studies that focused on language errors in the writing of languages other than English were excluded.
4. The studies which were not related to writing in the medical domain were excluded.
5. The articles that were not written in English were excluded.

A total number of ten articles or books related to error analysis of the English language in medical writing were selected after a long process of filtration.

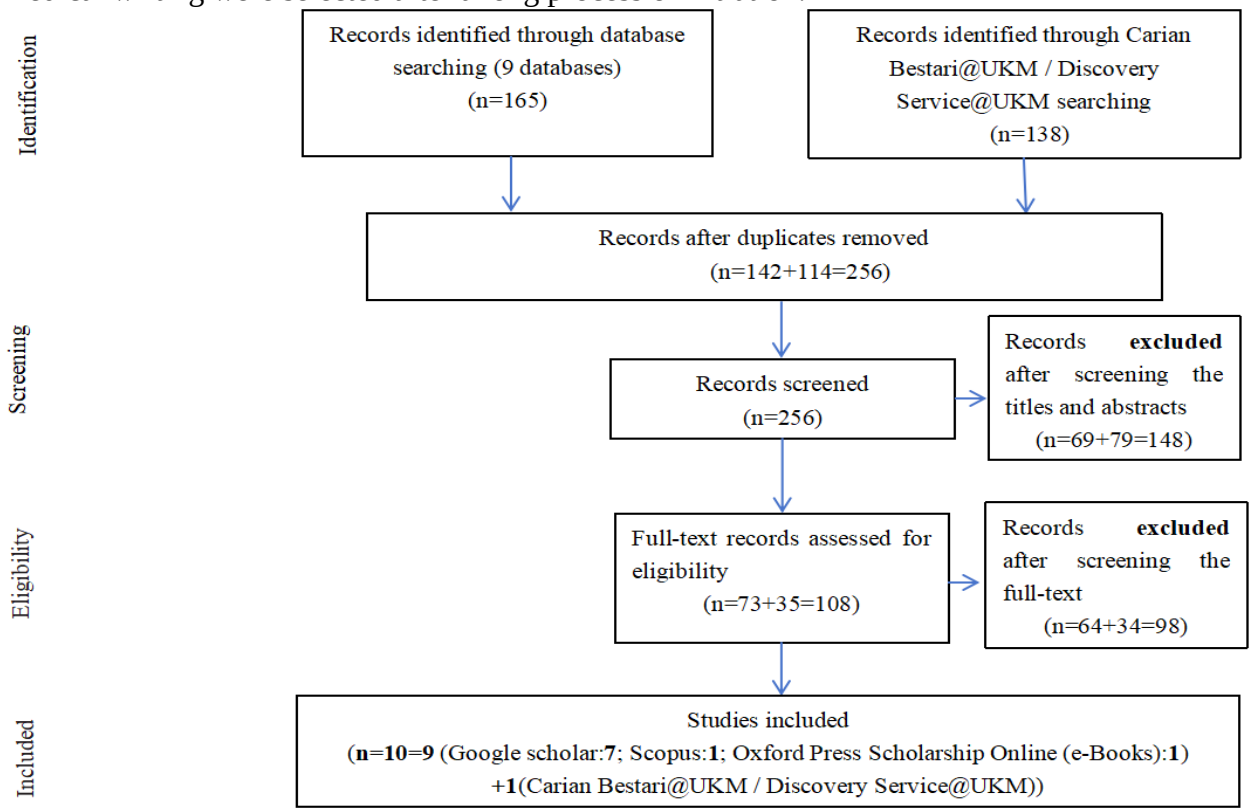


Figure 1. Flow chart showing the process of study selection

Results

The search in nine online databases and one platform produced a total number of 303 articles. Ten articles and books were finally included in this systematic literature review based on the criteria of inclusion and exclusion. This review answered these questions: (1) What types of language errors are discussed? (2) What types of medical writing are involved? (3) Which countries or areas are involved in the current literature? (4) What are the research methods used in the studies? (5) What tools are used in the studies? (6) What are the limitations of these studies?

The ten studies have discussed specific language errors as shown in the following table.2.

Table 2. *Errors discussed in the ten studies*

Studies	Errors discussed in the studies
Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021)	discourse, lexical, grammatical, and mechanical errors
ONO, Tomonori (2013)	12 categories of sentence-level errors
Lee, Eun-Pyo (2007)	10 categories of non-mechanical errors
Flaminia Miyamasu (2021)	lexicogrammatical errors (morphology, lexis, syntax, and orthography)
Naruemol Jirapanakorn (2012)	reporting verbs
John R Benfield and Kathryn M Howard (2000)	missing or incorrect article, improper word choice, ungrammatical sentence structure
Djemaa Kebaili and Fadhila Hadjeris (2016)	mechanic/substance errors, grammatical errors and errors related to syntactic aspects
Kenneth B Frisof and James L Moseley (1982)	spelling, grammar, and punctuation errors
Eva Braidwood and Suzy McAnsh (2013)	errors of cohesion and coherence, punctuation, grammar, word choice, over-informal lexis and idioms
Steve Hart (2016)	grammar, elements and data and terms

The types of medical writing involved in the ten selected studies are shown in Table 3. below.

Table 3. *Types of medical writing involved in the studies*

Studies	Types of medical writing
Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021)	published medical papers
ONO, Tomonori (2013)	journal articles
Lee, Eun-Pyo (2007)	the medical research abstracts
Flaminia Miyamasu (2021)	prepublication manuscripts
Naruemol Jirapanakorn (2012)	published medical research article introductions
John R Benfield and Kathryn M Howard (2000)	research papers
Djemaa Kebaili and Fadhila Hadjeris (2016)	published article abstracts
Kenneth B Frisof and James L Moseley (1982)	project papers
Eva Braidwood and Suzy McAnsh (2013)	mock research articles
Steve Hart (2016)	essays and papers

It can be seen that research articles or papers are the most frequently discussed type, followed by abstracts of the research articles, project papers, essays, and reports.

The locations of the medical writing studied are shown in table 4.

Table 4. *The locations of the medical writing studied*

Studies	Location	Area
Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021)	Iran	West Asia
ONO, Tomonori (2013)	various literary sources	various

Lee, Eun-Pyo (2007)	Republic of Korea	East Asia
Flaminia Miyamasu (2021)	Japan	East Asia
Naruemol Jirapanakorn (2012)	Thailand	Southeast Asia
John R Benfield and Kathryn M Howard (2000)	Japan, France, Italy, the Netherlands, Austria, Taiwan, Germany, Switzerland, and Korea	various
Djemaa Kebaili and Fadhila Hadjeris (2016)	Republic of Algeria	North Africa
Kenneth B Frisof and James L Moseley (1982)	Wayne State University, Detroit, Michigan	North America
Eva Braidwood and Suzy McAnsh (2013)	Finland	Northern Europe
Steve Hart (2016)	countries or areas where English is a second or third language	countries or areas where English is a second or third language

It needs to be noted that the location here means the countries or areas of the medical writing studied, neither the authors' nationality nor the institutions' location. The results reflect that most medical writings studied are from countries or areas where English is not a native language.

As to the research method, the quantitative method is used in five studies out of the 10 selected studies, the mixed method ranks second with three studies using it, and the qualitative method is chosen by two studies, which can be seen from table 5.

Table 5. *Research methods used in the studies*

Studies	Research Method
Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021)	quantitative
ONO, Tomonori (2013)	qualitative
Lee, Eun-Pyo (2007)	quantitative
Flaminia Miyamasu (2021)	mixed (quantitative and qualitative)
Naruemol Jirapanakorn (2012)	quantitative
John R Benfield and Kathryn M Howard (2000)	quantitative
Djemaa Kebaili and Fadhila Hadjeris (2016)	mixed (quantitative and qualitative)
Kenneth B Frisof and James L Moseley (1982)	quantitative
Eva Braidwood and Suzy McAnsh (2013)	mixed (qualitative and quantitative)
Steve Hart (2016)	qualitative

As for tools, Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021), Lee, Eun-Pyo (2007), Flaminia Miyamasu (2021), John R Benfield and Kathryn M Howard (2000), Djemaa Kebaili and Fadhila Hadjeris (2016), and Kenneth B Frisof and James L Moseley (1982) involve the statistical tools; Naruemol Jirapanakorn (2012) and Eva Braidwood and Suzy McAnsh (2013) use corpus tools; ONO, Tomonori (2013), Flaminia Miyamasu (2021), and Steve Hart (2016) use examples to analyze the errors. It can be found that statistical tools help researchers study language errors in a quantitative way, which makes the results evident for the audience to see.

The limitations of these studies are shown in Table 6.

Table 6. *Research limitations of the studies*

Studies	Limitation
Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021)	Samples were too few and the error source was not systematically discussed.
ONO, Tomonori (2013)	Just qualitative method was used.
Lee, Eun-Pyo (2007)	The samples were restricted to abstract only.
Flaminia Miyamasu (2021)	The writing samples analyzed were from authors of a single institution.

Naruemol Jirapanakorn (2012)	Only reporting verbs were studied.
John R Benfield and Kathryn M Howard (2000)	There were too few examples.
Djemaa Kebaili and Fadhila Hadjeris (2016)	Samples were too few and no authority helped.
Kenneth B Frisof and James L Moseley (1982)	The study just included one university.
Eva Braidwood and Suzy McAnsh (2013)	The statistical result hasn't been shown in the paper although it said it involved a corpus study.
Steve Hart (2016)	Just the qualitative method was used.

The above tables answered the 6 questions and showed the results of this systematic literature review. The results need to be discussed in detail to dig into the information behind them.

Discussion

The ten selected studies including articles and books from nine databases and one platform, indicate that the amount of research on the error analysis of the English language in medical writing is small and far from enough.

This review takes the categorization of language errors in the article by Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021) and classifies the language errors into four types: discourse, lexical, grammatical, and mechanical errors. Taking the definition of the four types of language errors in Nazila Farrokh Eslamloo, Mohammad Heidari, and Parvin Ayremloo (2021) into consideration and trying to avoid ambiguity, this review defines the four types of language errors as follows in table 7.

Table 7. *Definitions of language error types*

Types of errors	Definition
Discourse errors	Errors that relate to coherence, cohesion, ambiguity, and the whole text's meaning, but neither on lexical level nor sentence level.
Lexical errors	Errors of vocabulary including word choice other than functional words.
Grammatical errors	Errors related to tense, use of functional words, and singular/plural, subject-verb agreement, sentence structure.
Mechanical errors	Errors in spelling, punctuation, and capitalization.

As to the types of language errors discussed, each study has its specific focus, among which the most frequent types of errors discussed are the grammatical ones (9), followed by lexical errors (7), mechanical errors (5), and discourse errors (3) as can be seen from the table 8.

Table 8. *Types of language errors*

Studies	A	B	C	D
1	√	√	√	√
2			√	
3		√	√	
4		√	√	
5		√		
6		√	√	
7			√	√
8			√	√
9	√	√	√	√
10	√	√	√	√

(Note: the studies are labeled as 1 to 10 according to the orders in the tables shown in the previous part; A means discourse errors; B means lexical errors; C means grammatical errors; D means mechanical errors.)

More studies should be conducted on each type of English language error in medical writing. For example, on the lexical level, Jirapanakorn (2012) discussed errors of the reporting verbs in medical writing, while other kinds of lexicon can also be discussed from the perspective of error

analysis in the future.

Sharma (2017) classifies medical writing into three main types: regulatory medical writing, publication writing, and medical communication. And still, there is medical writing for education purposes and promotion purposes. According to the classification, all the ten studies included in this review focus on the type of publication writing. Among them, two are a little bit special. One pays attention to project papers and one discusses prepublication manuscripts, but these two can also be taken into account in the type of publication writing. More detailed types of medical writing such as reports or medical advertisements should be discussed.

The countries or areas of the medical writing studied, in large part, are locations where English serves as a second or third language, which confirms the theory and method of error analysis since error analysis is a theory born to serve the ESL (Khansir, 2012). It can be found that some studies of error analysis also discussed the English language errors committed by native speakers in "medical writing". Errors in medical writing in Asia are the most frequently studied among the ten studies with a proportion of 40%, followed by medical writing of locations of more than one place (30%), Europe (10%), Africa (10%), North America (10%). Medical writing of more countries and areas should be discussed from the perspective of error analysis, especially for countries and areas of ESL.

In this review, five studies (50%) use the quantitative method; 3 (30%) use the mixed method; 2 (20%) use the qualitative method. The quantitative method is the mainstream in error analysis of English language errors, which is efficient for readers to view the results directly and clearly. The mixed method also is a good choice. Just qualitative method is not that proper since the results are not clearly presented.

Based on the research methods, research tools are selected. In this review, 5 (50%) studies adopt statistical tools; 2 (20%) take corpus tools; 2 (20%) just use examples or sample tools; 1 (10%) use both statistical tools and sample tools. Statistical tools are used in quantitative research. Corpora and corpus tools are also proper tools for error analysis, for they can provide data and help to analyze data, which can be used more in future studies.

The most frequently discussed part of medical writing in these studies is the abstract part and the most frequently appeared English language errors are the lexical ones, among which articles appear the most times. Other types of language errors should be increasingly studied.

The limitations of these studies can be stated as the following aspects: (1) some studies have too few samples; (2) some studies were without quantitative methods and tools to show the results to readers clearly; (3) some studies rely on humans to do error identification; (4) the types of English language errors in medical writing are not systematically discussed; (5) the locations of medical writing are too limited; (6) the source of these language errors are not fully discussed. The limitations of the studies also show the gap between the studies on the error analysis of the English language in medical writing. Therefore, in the future, these gaps can be filled, for example, more samples should be included with the help of corpus; more advanced tools should be used in the studies, for example, AI tools can be used to enhance the efficiency and accuracy, meanwhile, simplify the process of human work; more locations of medical writing should be included, for example, medical writing in Asian countries such as China and Malaysia, European countries such as Russia, France, Italy and so on.

Conclusion

Writing well in the medical field is crucial for sharing new findings and treatment choices

effectively, and recording research results accurately. English has become the predominant language in the medical community since the latter part of the twentieth century (Maher, 1986; Ferguson, 2013). In medical writing, analysis of English language errors can not be skipped to share clear ideas with the audience. Therefore, this systematic literature review aims to find out the common language errors and the gap in the existing literature.

This review searched nine databases and one platform and finally included ten studies including articles and books. Types of language errors, types of medical writing, countries or areas of medical writing, research methods, research tools, and limitations of these ten studies are presented in this review. The most frequent types of errors discussed are the grammatical ones, followed by lexical errors, mechanical errors and discourse errors. Research articles or papers are the most frequently discussed type, followed by abstracts of the research articles, project papers, essays, and reports. The countries or areas of the medical writing studied, in large part, are locations where English serves as a second or third language, which confirms the theory and method of error analysis since error analysis is a theory born to serve the ESL (Khansir, 2012). Errors in medical writing in Asia are the most frequently studied among the ten studies, followed by medical writing of locations of more than one place, Europe, Africa, and North America. The quantitative method is the mainstream in error analysis of English language errors. Statistical tools are most frequently used, followed by corpus tools and examples or sample tools. The limitations of these studies can be stated as the following aspects: (1) some studies have too few samples; (2) some studies were without quantitative methods and tools to show the results to readers clearly; (3) some studies rely on humans to make error identification; (4) the types of English language errors in medical writing are not systematically discussed; (5) the locations of medical writing are too limited; (6) the source of these language errors are not fully discussed. The limitations of the studies also show the gap between the studies on the error analysis of the English language in medical writing. The review reveals the research gap of the studies on the error analysis of the English language in medical writing and points the future direction for it.

Funding: This research is not funded.
Conflicts of Interest: The author declares no conflicts of interest.
Authenticity: This manuscript is an original work.
Artificial Intelligence Statement: AI and AI-assisted technologies were not used.

About the Authors

Wei Shen is a PhD student in the English Language Studies Program at the Centre for Research in Language and Linguistics, Faculty of Social Sciences and Humanities, Universiti Kebangsaan Malaysia, Malaysia. Her research areas are corpus linguistics, second language acquisition, and translation. https://orcid.org/0009-0005-3791-5719

Dr. Afendi Hamat is an Associate Professor at the Centre for Research in Language and Linguistics, UKM, Malaysia. His research areas are e-learning and web-based CALL. He has developed various e-learning platforms such as the Second Language Instruction and Management System (SLIM) and the intelligent English Language Literacy System (iELLS). Email: fendi@ukm.edu.my ORCID ID: https://orcid.org/0000-0003-2060-9203

Jun Wang is an Associate Professor in the School of Foreign Studies, at Yanshan University,

China. Her research area is TEFL (Teaching English as a Foreign Language). Email: wywy@ysu.edu.cn ORCID ID: https://orcid.org/0009-0005-6246-7030

References

Ahmad, A., Shahid, H. S., & Farhat, P. A. (2023). Comparative Analysis of Syntactical Errors in the Writings of ESL Students at Secondary Level in Pakistan. *Global Language Review, VIII*, 203-213.

Aybek, S., & Can, C. A Bird's-eye View of Corpus-Driven Interlanguage Error Analysis of Portuguese EFL Learners and Data-Driven Teaching Suggestions for EFL Teachers. *APPI BOOK OF PROCEEDINGS, 51*.

Benfield, J. R., & Howard, K. M. (2000). The language of science. *European Journal of Cardio-Thoracic Surgery*, *18*(6), 642-648.

Braidwood, E., & McAnsh, S. (2013). The flowering of EAP/ESP: Customised support for the development of communicative competence in writing in the disciplines. *Language Learning in Higher Education*, *2*(1), 173-198.

Brown, D. H. (2000). *Principles of language learning & teaching. (4th ed.)*. New York: Longman, pp. 49-58.

Farrokh Eslamloo, N., Heidari, M., & Ayremloo, P. (2021). Knowledge Transfer and Academic Writing: English Writing Errors in Medical Writing of Iranian Authors. *International Journal of Information Science and Management (IJISM)*, *19*(2), 169-180.

Ferguson, G. (2013). Contacts and encounters in English as a Lingua Franca. *English Today*, 29 (04):61-62.

Frisof, K. B., & Moseley, J. L. (1982). Is Medical Student Writing Wrong? *ERIC*, ED225519.

Halim, A., & Halim, N. M. (2024, May). Errors Analysis in Writing: The Impact of L1. *In 4th International Conference on Linguistics and Culture (ICLC-4 2023)* (pp. 155-162). Atlantis Press.

Hart, S. (2016). *Writing in English for the Medical Sciences: A Practical Guide*. Boca Raton : CRC Press.

James, C. (2013). *Errors in Language Learning and Use: Exploring Error Analysis*. London and New York: Routledge.

Jirapanakorn, N. (2012). How doctors report: A corpus-based contrastive analysis of reporting verbs in research article introductions published in international and Thai medical journals. *The Bangkok Medical Journal*, *4*, 39-39.

Kebaili, D., & Hadjeris, F. (2016). *An Analysis of physicians' English language needs [Unpublished doctoral dissertation]*. University of Oum-El-Bouaghi.

Khaliq, N., & Abbas, K. (2024). Analysis of Common Syntactical Errors by Pakistani Students Due to L1 Influence. *Jahan-e-Tahqeeq*, *7*(2), 242-258.

Lee, Eun-Pyo. (2007). A study on error analysis & hedging expressions of medical research abstracts. *The English Teachers Association in Korea*, *13* (1), 47-66.

Maher, J. (1986). The Development of English as an International Language of Medicine. *Applied Linguistics*, *7*(2), 206-218.

Miyamasu, F. (2021). Chapter 6: Error analysis of overt lexicogrammatical errors in the prepublication English-language manuscripts of Japanese biomedical researchers (Eds.), *Opportunities and Challenges of English Academic Writing Education in Japanese Universities* (Version of Record, pp. 67-80). Hiroshima: Research Institute for Higher

Education, Hiroshima University.

ONO, T. (2013). The Construction of a Diagnostic Test for Error Analysis Purposes in Scientific Writing Courses. *International Christian University, 55,* 269-291.

Pardede, P., Lustyantie, N., & Iskandar, I. (2023). English Education Students' Thesis Abstracts Error Analysis: An EFL Learners' Corpora Study. *Journal of English Teaching*, *9*(3), 361-375.

Piroozan, A., Boushehri, E., & Fazeli, R. (2016). A review of English for medical purposes for Iranian EFL learners. *Journal of Advances in English Language Teaching*, *4*(2), 24-29.

Richards, J. C., & Schmidt, R. (2002). *Dictionary of Language Teaching Applied Linguistics*. Pearson Education Limited. London: Longman.

Sharma, S. (2010). How to Become a Competent Medical Writer? *Perspectives in clinical research*, *1*(1), 33-37.

Sharma, S.(2017). Development of medical writing in India Past, present and future. *Perspectives in Clinical Research*, *8*(1), 45-50.

Zhang, Z., & Wáng, Y. X. J. (2015). English language usage pattern in China mainland doctors: AME survey-001 initial analysis results. *Quantitative Imaging in Medicine and Surgery*, *5*(1), 174-181.