

Major mistakes in scientific medical writing based on manuscripts' reviews

Les erreurs majeures dans l'écriture scientifique médicale basées sur les critiques de manuscrits

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ABSTRACT

Introduction: Peer review is a crucial process in ensuring the quality and accuracy of scientific research. It allows experts in the field to assess manuscripts submitted for publication and provide feedback to authors to improve their work.

Aim: To describe mistakes encountered while peer reviewing scientific manuscripts submitted to "La Tunisie Médicale" journal.

Method: This was a bibliometric study of research manuscripts submitted to "La Tunisie Médicale" and reviewed during 2022. The data collected included the type of the manuscripts and the number of reviews conducted per manuscript. The study also identified variables related to writing mistakes encountered during the peer review process.

Results: A total of 155 manuscripts (68% original articles) were peer reviewed and 245 reviews were delivered, by two reviewers. Out of 62 mistakes detected, 21% concerned the results section. In 60% of the manuscripts, the keywords used were not MeSH (Medical Subject Headings) terms. The introduction lacked in-text citations in 30% of the reviewed manuscripts, while the method section did not have a clear study framework (27%). The two major mistakes detected in the results section were the misuse of abbreviations in tables/figures, and the non-respect of the scientific nomenclature of tables/figures with respectively 39% and 19% of manuscripts.

Conclusion: This study identified 62 mistakes while reviewing scientific manuscripts submitted to "La Tunisie Médicale" journal. Scholars can benefit from participation in scientific writing seminars and the use of a safety checklist for scientific medical writing to avoid basic mistakes.

Key words: Peer Review – Medical Writing – Manuscripts, Medical as Topic – Writing style – Tunisia

RÉSUMÉ

Contexte: Le review par les pairs est un processus crucial pour garantir la qualité et l'exactitude de la recherche scientifique. Il permet aux experts d'évaluer les manuscrits soumis pour publication et de fournir des commentaires aux auteurs pour améliorer leur travail.

Objectif: Décrire les erreurs rencontrées lors du reviewing par les pairs de manuscrits scientifiques soumis à la revue "La Tunisie Médicale".

Méthode: Il s'agissait d'une étude bibliométrique des manuscrits de recherche soumis à "La Tunisie Médicale" et examinés en 2022. Les données collectées comprenaient le type de manuscrits et le nombre de reviewing par manuscrit. L'étude a également identifié les variables liées aux erreurs de rédaction rencontrées lors du processus d'évaluation par les pairs.

Résultats: Au total, 155 manuscrits (68% d'articles originaux) ont été évalués par les pairs et 245 évaluations ont été réalisées par deux examinateurs. Sur 62 erreurs détectées, 21% concernaient la section des résultats. Dans 60% des manuscrits, les mots-clés utilisés n'étaient pas des termes MeSH (Medical Subject Headings). L'introduction manquait de citations dans le texte dans 30% des manuscrits examinés, tandis que la section méthodologique ne présentait pas de cadre d'étude clair (27%). Les deux principales erreurs détectées dans la section des résultats étaient l'utilisation incorrecte d'abréviations dans les tableaux/figures et le non-respect de la nomenclature scientifique des tableaux/figures, avec respectivement 39% et 19% des manuscrits.

Conclusion: Cette étude a identifié 62 erreurs lors de l'évaluation de manuscrits scientifiques soumis à la revue "La Tunisie Médicale". Les chercheurs peuvent tirer parti de leur participation à des séminaires d'écriture scientifique et de l'utilisation d'une liste de vérification de sécurité pour l'écriture médicale scientifique afin d'éviter des erreurs de base.

Mots clés: Review par les pairs - Rédaction médicale – Manuscrits, Médical comme sujet - Style d'écriture - Tunisie

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INTRODUCTION

Peer review of research manuscripts is an efficient method adopted by journal editors to guarantee and maintain high quality and standards for papers to be accepted for publication (1). The ultimate goal of the peer review process is to promote good science by engaging in continuous learning and assisting authors in improving their manuscripts (1). Except for some open access journals, peer reviewing is not driven by financial gain (2), and it requires a significant investment in both time and expertise from the reviewer (3). The number of reviewers per article published depends solely on the number of peer reviewers per manuscript and the journal's rejection rate (4).

Various methods are currently available for researchers to improve the quality of their manuscripts and to ease the burden of peer reviewing, such as using the updated version of the recommendations published by the International Committee of Medical Journal Editors (ICMJE) (5). However, in low- and middle-income countries, writing and publishing can become an overwhelming task for many healthcare professionals who lack prior knowledge in scientific medical writing (6), especially if their native language is not English (7). To relieve the burden on both authors and reviewers, avoiding frequent mistakes while developing a scientific manuscript and conducting a prior auto-review (authors) can be considered potential solutions. Additionally, creating a safety checklist specifically for authors could be of great benefit to facilitate a pre-review step before manuscript submission.

Therefore, the aim of this study is to describe the mistakes encountered while peer reviewing scientific manuscripts submitted to the "La Tunisie Médicale" journal (ISSN electronic 2724-7031) in 2022.

METHODS

This was a bibliometric study of all research manuscripts submitted to "La Tunisie Médicale" (8) (NLM title abbreviation: Tunis Med (9)) and reviewed during 2022. Tunis Med, which is the only indexed Tunisian journal in Medline (Box 1), was created back in 1903 (8), and it accepts all types of journal articles, from case reports to meta-analyses. The acceptance policies of Tunis Med have become stricter over the years due to the increasing trend of manuscript submissions; as a consequence, peer review has become an essential part of its activity. Tunis Med manuscripts are peer reviewed by national and international medical educators. The manuscripts are anonymized, and each manuscript is sent to one, two, or three reviewers who provide anonymous comments to authors. Tunis Med has reached out to some reviewers to dedicate themselves fully, during a certain amount of time, to reviewing manuscripts, and focusing essentially on the scientific medical writing aspect, as a strategy to help the journal face some difficulties such as unavailability of peers for the reviewing process.

Box 1. General characteristics of the journal "La Tunisie Médicale" (9,10)

NLM Title Abbreviation :	Tunis Med
Title :	La Tunisie Médicale
Frequency :	Monthly
Country of Publication :	Tunisia
Language :	French, English
Current Indexing Status :	Currently indexed for MEDLINE.
Broad Subject Term(s) :	Medicine
Cite score 2021 :	0.8
Quartile 2021 :	Q3
URL address :	http://www.latunisiemedicale.com/?CodeLang=en

This study analysed review texts delivered by two members of the editorial board of Tunis Med (who adopted a coaching approach), and the journal website (e.g. journal database) was not consulted. For ethical considerations, the first author (SM) obtained prior agreement from the two reviewers who served as reviewers for Tunis Med during the year 2022 (last two authors of this manuscript, HBS, and ABA) to refer to their review texts for the purposes of this study. The data collected were the type of manuscripts (original articles, case reports, editorials, or other) and the number of reviews done per manuscript. Then, we collected the various mistakes detected by the two reviewers related to the following sections: the overall relevance of the study, the manuscript title, keywords, abstract, introduction, methods, results, discussion, references, illustrations, as well as general mistakes. These variables were identified while reading the reviewers' texts.

The statistical analysis was done using the SPSS software. Results were expressed using means and standard deviations (SDs), effectives, and percentages (both for the overall manuscripts and reviews) and presented using tables and figures.

RESULTS

During 2022, 155 scientific manuscripts were peer reviewed, and the two reviewers delivered 245 reviews, resulting in a mean review per article of 1.6 (SD=1.0) (minimum = 1 and maximum = 5). The research topic was judged not pertinent in 4% of the manuscripts. The majority of the manuscripts reviewed were original articles (68.4%) followed by case reports (27.1%) (Table 1).

Table 1. Types of the 155 manuscripts submitted to the journal "La Tunisie Médicale" and reviewed during 2022.

	Effective (n)	Percentage
Original article	106	68.4
Case reports	42	27.1
Editorial	3	1.9
Literature review	2	1.3
Methodological sheet	1	0.4
Educational manuscript	1	0.4

A total of 62 mistakes were detected for which one fifth of them (21%) being in the results section (Figure 1).

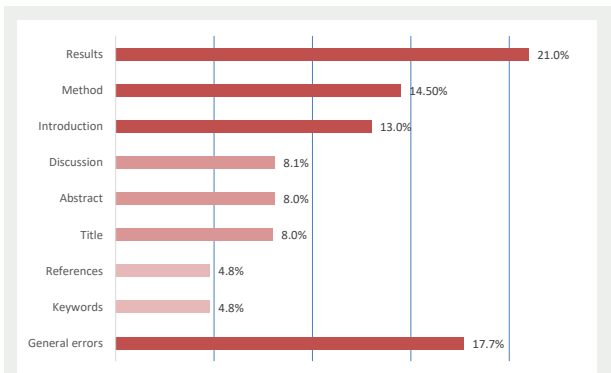


Figure 1. Percentages of mistakes detected in the manuscripts submitted and reviewed in the journal “La Tunisie Médicale”, during 2022 (N=62)

In more than half of the manuscripts reviewed (60%), the keywords used were not MeSH (Medical Subject Headings) terms, and in 26.4% there have been a misuse of abbreviation in the abstract (Table 2.a). Table 2.b summarizes the mistakes detected by the two reviewers in the main text of the 155 manuscripts. The introduction section lacked citation in 30% of the manuscripts, and in 27% of manuscripts, the method part did not have a clear study framework (description of the population, location and period of the study). In almost 40% of the manuscripts and in the results section there have been a misuse of abbreviation in tables and figures (were not explained in tables/figures’ footnotes). The sample size was not calculated in 18% of total articles and 26% among original manuscripts. The major two mistakes in the discussion section were the fact that main results were not reminded in the beginning of this section (28.4%) and there was no mention of the study limitation in 21.3% of the total manuscripts. For citation mistakes, 40.6% of the manuscripts did not use the Vancouver style, recommended by the journal, and in in-text citation mistakes were detected in 15.5% of reviewed manuscripts. The misuse of abbreviations and language and spelling mistakes were the leading general mistakes in 64.5% and 58.7% of manuscripts, respectively (Table 2.c). Figure 2 summarizes the top 20 mistakes detected in the 155 manuscripts reviewed.

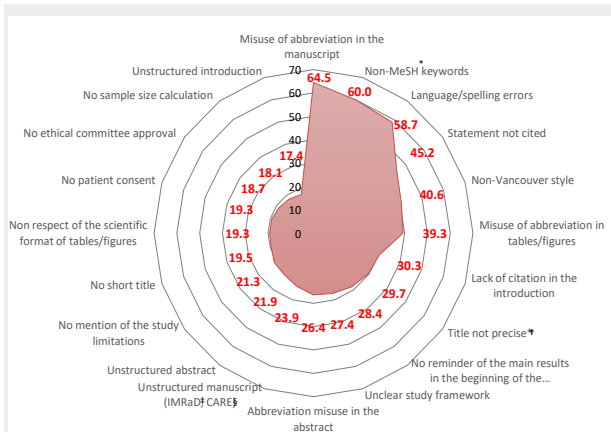


Figure 2. Top 20 mistakes (in percentages) detected in the 155 manuscripts submitted to the “La Tunisie Médicale” journal during 2022

*Medical Subject Headings. †No mention of the type of the study and/or population and/or outcome. ‡Introduction, Methods, Results and Discussion. §CAse REports

Table 2. Major mistakes detected in the 245 reviews done for the 155 manuscripts submitted to the journal “La Tunisie Médicale” during 2022

a. Mistakes detected, in the title, keywords and abstract.

	Effective (n)	Percentage (N= 245 reviews)	Percentage (N= 155 articles)
Title			
Title not precise*	46	18.8	29.7
No short title	30	12.2	19.5
Title not informative†	18	7.3	11.6
Capital words in the title	5	2.0	3.2
Long title	3	1.2	1.9
Keywords			
Non-MeSH‡ keywords	93	38.0	60.0
No sorting in alphabetical order	8	3.3	5.2
No separation between the keywords	4	1.6	2.6
Abstract			
Abbreviation misuse in the abstract	41	16.7	26.4
Unstructured abstract	34	13.9	21.9
Abstract conclusion not coherent with the results	21	8.6	13.5
Long abstract	21	8.6	13.5

*No mention of the type of the study and/or population and/or outcome. †The title does not reflect the study. ‡Medical Subject Headings.

b. Mistakes detected in the main text of the manuscript (introduction, methods, results, discussion and references sections).

	Effective (n)	Percentage (N= 245 reviews)	Percentage (N= 155 articles)
Introduction			
Lack of in-text citation in the introduction	47	19.2	30.3
Unstructured introduction	27	11.0	17.4
Unspecified objective	22	9.0	14.2
Poor formulation of the research problem	15	6.1	9.7
No objective in the introduction	5	2.0	3.2
Long introduction	3	1.2	1.9
Telegraphic style of the introduction	2	0.8	1.3
Introduction too specialized	1	0.4	0.6
Methods			
Unclear study framework	42	17.1	27.1
No sample size calculation	28	11.4	18.1
Small sample size	18	7.3	11.6
No use of the past	17	6.9	11.0
No statistical analysis plan	16	6.5	10.3
Study design not appropriate to the objective	14	5.7	9.0
Mono-centrism	12	4.9	7.7
Non-randomized sample	5	2.0	3.2
No principal judgment criterion	3	1.2	1.9
Results			
Misuse of abbreviation in tables/figures	61	24.9	39.3
Non respect of the scientific nomenclature of tables/figures	30	12.2	19.3
Non-informative table/figure titles	24	9.8	15.5
Analysis incompatible with the study design	21	8.6	13.5

b. (continued) Mistakes detected in the main text of the manuscript (introduction, methods, results, discussion and references sections).

	Effective (n)	Percentage (N= 245 reviews)	Percentage (N= 155 articles)
Table with more than three horizontal lines	20	8.2	13.0
Redundant tables/figures with the text	17	6.9	11.0
Unnumbered tables/figures	11	4.5	7.1
Narrative style of the results section	10	4.1	6.4
Un-announced tables/figures in the text	8	3.3	5.2
Use of coloured background in tables/figures	6	2.4	3.9
No standard deviation with the mean	5	2.0	3.2
Similar tables/figures	4	1.6	2.9
Use of numbers at the beginning of a sentence	2	0.8	1.3
Discussion			
No reminder of the main results in the beginning of the discussion	44	18.0	28.4
No mention of the study limitations	33	13.5	21.3
Individualized conclusion	17	6.9	11.0
Conclusion not based on study results	7	2.9	4.5
No comparison with similar studies	3	1.2	1.9
References			
Non-Vancouver style	63	25.7	40.6
Not up-to-date	18	7.3	11.6
Not right justified	1	0.4	0.6

c. General mistakes

	Effective (n)	Percentage (N= 245 reviews)	Percentage (N= 155 articles)
Misuse of abbreviation in the manuscript	100	40.8	64.5
Language/spelling mistakes	91	37.1	58.7
Lack of in-text citations	70	28.6	45.2
Unstructured manuscript (IM-RaD*, CARE†)	37	15.1	23.9
No patient consent	30	12.2	19.3
No ethical committee approval	29	11.8	18.7
Citation mistakes	24	9.8	15.5
PDF version not similar to the Word version	15	6.1	9.7
Writing style not conform to the principal of medical writing	10	4.1	6.4
Incorrect unit nomenclature	6	2.9	3.9
No prior registration of the study	2	0.8	1.3

*Introduction, Methods, Results and Discussion. †CAsE REports

DISCUSSION

This study included a total of 155 manuscripts with a total number of reviews equal to 245. The main mistakes detected by the reviewers were found in the Results section (21%), followed by the Methods section

(14.5%). The cycle of research is incomplete without communicating its findings to the scientific community. However, healthcare professionals have declared that among the reasons that prevent them from publishing is the lack of awareness of current reporting guidelines and inadequate scientific writing expertise (11).

The aim of this study was to detect mistakes in scientific manuscripts submitted to the "Tunis Med" journal and reviewed during 2022. However, it is not immune to some methodological limitations. On one hand, the use of a single journal to extract reviewers' comments may be considered a selection bias. However, this is the only indexed journal in Tunisia that uses peer reviewing in manuscript selection. On the other hand, the moderate number of manuscripts included is due to the fact that we included review texts from two members of the editorial board dedicated to peer review. This choice was based on them being reviewers who were dedicated, in a critical time, to helping the "Tunis Med" journal maintain its Medline indexation. Therefore, the present study did not focus on the pertinence or relevance of the study but instead accorded much more concern to the accuracy of scientific medical writing.

Unclear study framework

One of the main authors' mistakes found in the present study results was the unclear manuscript frameworks of the reviewed manuscripts (27%). The methods section is an essential part of a scientific manuscript because it clarifies how and why a study was done and ensures its reproducibility (5). This section should contain, among others, the type of study (in accordance with the objective), a clear description of the selected participants (eligibility and inclusion/exclusion criteria), their source population, the sampling process (e.g., randomized, convenient...), and the duration and location of the study. There are numerous checklists available online helping researchers depending on the study type, such as CONSORT (12) for randomized controlled trials, PRISMA (13) for systematic reviews, and STROBE (14) for observational trials. Moreover, journals such as "Tunis Med" periodically provide helpful resources (articles, editorials) to promote good writing practices (15–23). Although there are available means for scientific researchers to enhance their writing skills of the methods section, some do not refer to these international guidelines. This may be due to the ignorance of their existence or wanting to publish their manuscripts rapidly. The literature also reported similar errors as shown in this study. Bordage (24) reported that problems encountered in the research design were one of the top five reasons for manuscript rejection. Another study concluded that methodological details were insufficiently identified, and the methods section was not clear in 66% and 35%, respectively (25).

Non-scientific tables

The second major error detected in this study was noted in the results section with a misuse of abbreviation in tables

and/or figures in 39% of the articles reviewed and the non-respect of the scientific format of tables and/or figures (19%) with the use of more than three horizontal lines to report scientific tables (13%). Tables are used in scientific manuscripts to summarize the results in a concise and effective way. They also should be readable and comprehensible independently of the rest of the text. Therefore, the use of abbreviations in tables compromises the delivery of information and makes the tables heavily dependent on the manuscript. According to the ICMJE (5), all non-standard abbreviations should be explained in footnotes. In addition, there are some regulations to draw a scientific table. Tables should be in borderless grids of rows and columns with no vertical rule and limited horizontal rules (generally three) (26). According to the American Psychological Association concerning the format style of a scientific table, the use of borders or lines should be limited to those needed, generally to the use of top, bottom, and beneath column headings borders (27). However, most authors, while displaying tables in scientific manuscripts, omit these recommendations and adopt a more attractive visual style with more than three horizontal lines and vertical lines. This may be considered a reason for manuscript rejection if not addressed. In fact, defective tables or figures were responsible for the rejection of 2.5% of manuscripts submitted to the Research Medical Education Journal (24).

Citations' mistakes

This study identified a number of mistakes in the scientific manuscripts reviewed during 2022. One type of mistake was the lack of in-text citations, which was found in 30.3% of the introductions and 45.2% of other parts of the manuscripts. In addition, in-text citation mistakes were found in 15% of the total manuscripts reviewed. Moreover, 40.6% of the total manuscripts did not follow the Vancouver style of referencing, which is the style adopted by the "Tunis Med" journal. Citations in a scientific manuscript have three main components: quoting from others, in-text citation, and a list of references (28). The purpose of using citations is to support arguments, acknowledge others' work, direct readers to sources of information, and avoid plagiarism (28). There are numerous tools that facilitate the citation process, such as Zotero (29). However, authors may not use or misuse citations due to a lack of awareness, non-participation in offered seminars on how to use citation tools, and a lack of knowledge of when it is mandatory to cite. Furthermore, the reduced number of citations may be due to the number of references imposed by journals and the fact that in-text citations do not have a standardized bibliography format and are difficult to extract (30). The international literature has highlighted the frequency of citation mistakes, with a prevalence of misquotation ranging from 10% to 20% (28), and about 15% of plagiarism due to improper citation and referencing (31). A quick research using the Artificial Intelligence (AI) chatbot launched by OpenAI, called "ChatGPT" (Chat Generated Pre-trained Transformer) (32), regarding the main mistakes detected by reviewers

has identified mistakes more related to the manuscripts' content (methodology and pertinence of the study) rather than basic form mistakes (Box 2).

Box 2. Main mistakes detected by reviewers in scientific manuscript according to the artificial intelligence ChatGPT* (32)

d what are the main mistakes detected by reviewers in scientific manuscripts

As an AI language model, I have access to a large number of scientific papers and can provide some common mistakes that reviewers may detect in scientific manuscripts. Some of the most common mistakes include:

1. Lack of clarity and organization: Scientific manuscripts should be well-organized and easy to follow. Reviewers may detect issues with unclear writing, poor organization of the content, or lack of a clear thesis or argument.
2. Insufficient or outdated literature review: A strong literature review is an essential part of a scientific manuscript. Reviewers may flag issues with an insufficient or outdated literature review, or a failure to acknowledge relevant studies.
3. Inadequate methodology: Reviewers may identify issues with the study design, sample size, or data collection methods, which can compromise the validity and reliability of the results.
4. Unsupported conclusions: Conclusions should be supported by the data presented in the manuscript. Reviewers may flag issues with unsupported or exaggerated conclusions.
5. Lack of originality: Manuscripts should contribute new knowledge to the field. Reviewers may identify issues with a lack of originality or novelty in the research.
6. Inaccurate or incomplete data: Reviewers may identify issues with inaccurate or incomplete data, or a failure to report important results or findings.
7. Poor writing and grammar: Reviewers may identify issues with poor writing and grammar, which can make the manuscript difficult to read and understand.

Overall, reviewers are looking for manuscripts that are well-written, well-organized, and contribute new knowledge to the field in a valid and reliable manner.

*Chat Generated Pre-trained Transformer. Date of access February, 27th 2023

In conclusion, this study highlights major mistakes of scientific medical writing encountered while reviewing scientific manuscripts submitted to the "Tunis Med" journal during 2022. The main mistakes were found in the results section, with non-scientific tables and an unclear and insufficient description of the study framework in the methods, as well as citation mistakes such as lack of in-text citation and failure to follow the Vancouver referencing style requested by the journal. To help scholars avoid these basic mistakes, inclusion and participation in scientific writing seminars are crucial at both the medical school and post-graduate level. Besides, additional future works concerning both the pertinence and the redaction of manuscripts could be needed. And finally, the development of a safety checklist for scientific medical writing would be of great help, both for authors to evaluate basic manuscript conformity before submission and for reviewers to focus more on content than structure. The following checklist includes all parts of scientific manuscripts and covers all sections (Box 3).

Box 3. Safety checklist for scientific medical writing based on mistakes identified by the reviewers

	Yes	No
Title		
1) Be precise while writing the title of the study (should include the study population and/or the population and/or the outcome)		
2) Do not forget the short title		
Abstract and keywords		
3) Avoid using abbreviations in the abstract		
4) Do not exceed the word limit for the abstract (generally < 300 words)		
5) Use MeSH (Medical Subject Headings) terms as keyword and avoid citing as keywords, some terms previously used in the title or the abstract		
Introduction		
6) Use enough citations in the introduction (1/3 of total citations)		
7) Formulate clearly the research problem		
8) Write the objective of the study as last sentence of the introduction		
Methods		
9) Describe the study population (source population, inclusion and non-inclusion criteria and the selection method)		
10) Indicate the location and period of the study		
11) Calculate the sample size needed for the study		
Results		
12) Make sure that all tables and figures are numbered and announced in the results text		
13) Avoid using abbreviations in tables/figures		
14) If the abbreviations are needed, they should be explained in tables'/figures' footnote		
15) Tables should be in borderless grid with no vertical lines, and three horizontal lines: on top, on bottom, and beneath column headings		
Discussion and conclusion		
16) Write a reminder of the study results in the beginning of the discussion section		
17) Mention the study limitations		
18) Write the conclusion as the last paragraph of the discussion		
Citations		
19) Use the recommended referencing style of the journal		
20) Use up-to-date references		

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