In the name of Allah the compassionate the merciful

Paper Writing

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Characteristics of a scientific article

- 1. Principles: Compliance with scientific principles.
- 2. Simplicity: The beauty of a scientific article (unlike literary writing) is in its simplicity
- 3. Clarity: Be very clear and comprehensible to the audience.
- 4. Written order (Vancouver method):
 - 1. Title; 2. Authors; 3. Abstract;
 - 4. Introduction; 5. Materials and methods; 6. Findings; 7. Discussion;
 - 8. Conclusion; 9. Acknowledgments, and 10. Resources.

Title Page

- Title (bold font),
- Authors name and family,
- Affiliations,
- Running title,
- Corresponding author address, Email, and Phone, and
- Conflict of interest declaration.

Selective Reading

- Title 100%
- Abstract (first & last lines) 93%
- Abstract (the rest), References 60%
- Introduction 40%
- Methods − 33%
- Results (especially figures, tables)- 27%
- Discussion 27%

Types of Medical Writing

- 1. Editorial
- 2. Letter to Editor
- 3. Scientific or Original Article
- 4. Review Articles
- 5. Meta Analysis
- 6. Case Reports
- 7. Conference Report
- 8. Meeting Abstract
- 9. Personal Views
- 10. Special Communication
- 11. Brief Report or Short Communications



Types of articles

- 1. Scientific paper (Original article)
- 2. Review paper (systematic review)
- 3. Meta Analysis
- 4. Conference Report
- 5. Meeting Abstract
- 6. Case Report
- 7. Brief Report (Short C
- 8. Letter to the Editor
- 9. Editorial
- 10. Personal Views
- 11. Special Communica



Original Article Sections

- 1. Title (Title Page)
- 2. Authors and Affiliations
- 3. Abstract and Key Words
- 4. Introduction
- 5. Materials and Methods
- 6. Results
- 7. Discussion
- 8. Conclusion
- 9. Acknowledgments
- 10. References

Write in what order?

- 1. Title, Authors and Affiliations
- 2. Materials and Methods
- 3. Results
- 4. Introduction
- 5. Discussion and Conclusion
- 6. Acknowledgements
- 7. Abstract and Key Words
- 8. References

Title

1. Attention to type of Research:

1. Descriptive, Analytical, Experimental, Other

2. Avoid from redundant and waste words such as:

1. A study of, A survey of, An investigation on/of, Studies/Investigations on, A research on, ...

3. Avoid from write study type such as:

1. report of, a case of, presenting a model, designing a framework, assessment of prevalence, evaluation of the frequency

4. Avoid use of Abbreviations

Title

- 1- Precision: Its words should be chosen very carefully
- 2- Title length: It should not be too short or too long (in both cases it is difficult to understand the topic.)
- 3- Not using general words: you should use words that specifically describe the desired content.
- 4- Observance of grammar: putting words in proper grammatical order to understand the topic and avoid mistakes

Running Title

Title:

Students' evaluation of teaching effectiveness: A structural modeling approach

Running title:

Students' evaluation of teaching

• Title:

Review of the Literature on PBL in the clinical setting

Running title:

PBL in the clinical setting

Authorship

1: Contribution in design, or Data collection, or Analysis

and

2: Writing, Editing, or Criticism of manuscript

and

3: Final Approval

and

45/07 Responsibility Mansour Rezaei

Authors Order:

According to role and participation

- First author
 - Design the study
 - Conducting
 - Writes first draft
 - Data collection
 - Partners with last author for subsequent drafts
- Last author
 - Experienced investigator who partners with first author in interpretation, analysis, and writing
 - General responsible
 - Senior author or mentor
- Second author
 - Major contribution
- Middle authors
 - Everyone else who qualifies for authorship
- Correspond author: E-Mail, Address

Authors

Authors' names are written in two ways:

- a) According to the letters of the alphabet (Uncommon, mainly used in England).
- b) Based on their role or participation rank in research:
 - 1. Author's first name (full or initial);
 - 2. Last name;
 - 3. Educational degree and
 - 4. Scientific address.

Affiliations

- Place of Affiliations:
 - Footnote or
 - under authors name
- Scientific Rank:

Professor of Biostatistics

Department or Research Center:

Social Development and Health Promotion Research Center

• Institute:

Kermanshah University Of Medical Science, Kermanshah, Iran

• Email:

rezaei39@yahoo.com

• Phone:

+989183318978

- A complete summary of the main parts of the article
- The same article in smaller dimensions
- Most of the readers read the abstract after the title and refer to the main article if needed, so it is very important.
- The abstract is written after finishing writing the article, but it must be given at the beginning of the article.

Two types Abstracts

• **Descriptive** or indicative:

150 words for unstructured abstract (such as Brief Report)

• Informative:

250 words for structured abstract

Questions to be answered here:

- 1. Why did you do the study?
- 2. How was the study done?
- 3. What did you find?
- 4. Why are these findings important?

- Self-contained
- Concise
- Specific
- Active voice
- Non evaluative
- Coherent
- Readable

- Critical part of paper
- State main objective or Purpose of the study
- Material & methods
- Summarize most important results (Main findings: Data and its significance)
- State major and the principal conclusions and its importance
- Avoid abbreviations
- Write and rewrite until satisfaction

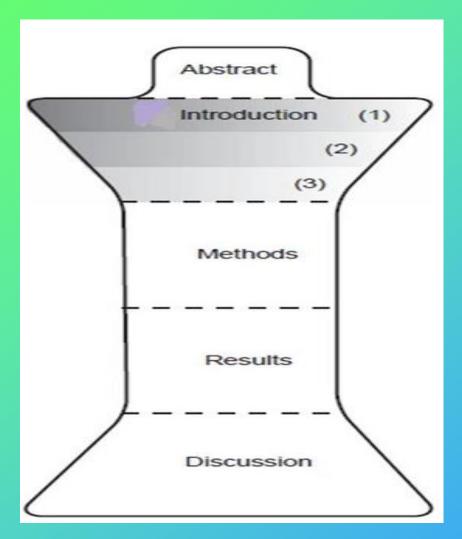
Abstract Characteristics

- 1. Being short: it should not be more than about 250 words,
- 2. Containing all the contents (4 main parts) of the article;
- 3. Do not use unknown abbreviations and synonyms;
- 4. The terms are summarized as much as possible;
- 5. Verbs are mainly expressed in the past tense;
- 6. Emphasize the new findings of the study.
- 7. There is no need to write a reference.
- 8. At the end, three to five keywords are given.

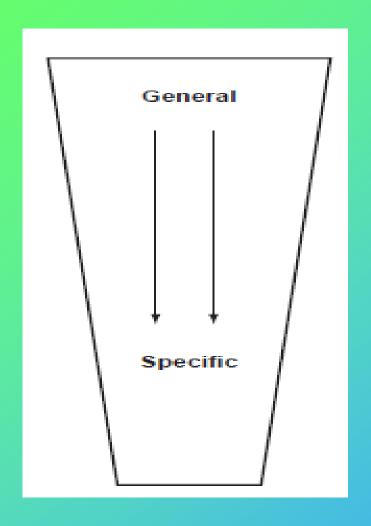
Key words:

- MeSH: Medical Subject Headings terms.
- 3-7 Key words
- For search and citation

Size of Articles Parts









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Answer to these Questions:

- 1. What is the Problem?
- 2. Why is it Important?
- 3. What is the Approach?
- 4. What should it accomplish?
- 5. What I like?
- 6. What is the Gap?

4 short segments:

- Problem statement
 - Does not review field
- Why is it important?
- What is context?
- Purpose of study
 - Sets complete roadmap for paper
 - Followed in order and with same words for rest of paper

What reader reads (if at all)

- First sentence or two
- Last sentence or two

Evaluation

- Does it rapidly tell me where this paper is headed?
- Can it be better focused?
- Does it make a case for itself?
- Are we talking people or animals?
- Does the author follow the map?

- 1) Stating the topic or defining the problem under investigation clearly;
- 2) A review of previous texts and information to create a previous mental background in the reader using references that are completely related to the topic;
- 3) Stating the different methods of investigating the subject and choosing the researcher's special method;
- 4) Mentioning the important results of previous investigations;
- 5) Mentioning important decisions based on the results of previous studies,

- 6) It is necessary to mention references.
- 7) It is the best place to define abbreviations so that there is no problem if they are used in the next parts of the article;
- 8) Referring to the necessity of the study, innovation or the characteristic of the study,
- 9) Mentioning the purpose of the study and its possible applications,
- 10) Verbs in the introduction are written in the present tense;
- 11) Never write the findings of your article in this section.

Materials and methods

- 1- Describe the study design completely and with more details so that other people can repeat it if needed.
- 2) Verbs are expressed in the past tense in most parts of materials and methods.
- 4) Materials: Mentioning the conditions and reason for choosing work tools, special drugs, and samples for study, exclusion entry criteria and inclusion exclusion criteria.
- 5) Methods: Definition of the community, how to conduct the study and the method of data collection and analyze the data

Materials and methods

- 6- The type of study and its design,
- 7- The data collection method and its tools,
- 8- Research environment and people participating in the study,
- 9- The investigated variables,
- 10- Control of confounders and avoidance of bias,
- 11- Target population, sample size and sampling method,
- 12- Ethical considerations and limitations, and
- 13- Statistical analysis methods and software

Materials & Methods

- 1. How was the study done?
- 2. Should I believe this study?
- For selective, strategic readers:
 - Rarely read in total if at all
- For reviewers:
 - Inadequacies often identified
- For science:
 - Is study valid?
 - Is it replicable?

Materials and Methods

If patients (for example)

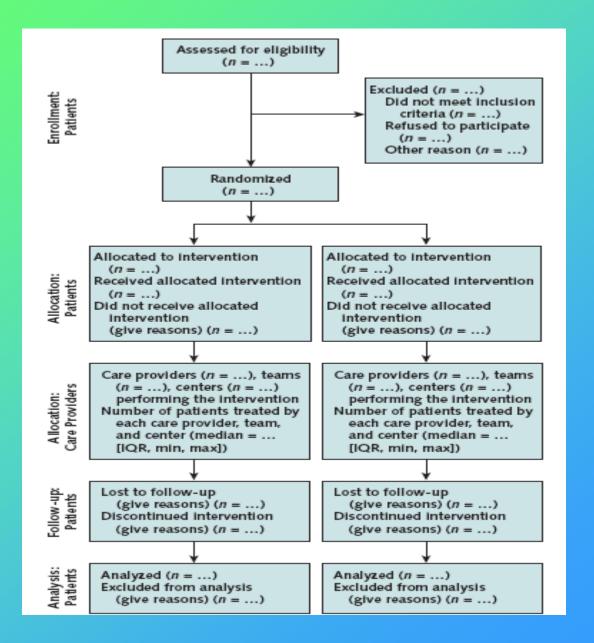
- What was done?
- Where?
- Time frame?
- Context?
- Inclusion/exclusion criteria?
- How many?
- Characteristics of patients?

CONSORT Flow Diagram

How was study group assembled?

- Base group included
- Specific exclusions
- Analysis group

Example for CONSORT Flow Diagram



Data analysis

- Organize according to purposes of study
- Provide detail or references to technical methodology
- Don't leave loopholes!
 - Most common error is not listing variables considered in analyses

Evaluation

- 1. A checklist is valuable for authors, evaluators, and readers
- 2. Often contentious
 - -Old methods
 - -Unfamiliar methods
 - -Complex methods
- 3. Materials:
 - Exclusion criteria
 - Inclusion criteria

Ethics:

- 1. When reporting experiments on human subjects, indicate whether the procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional or regional) and with the Helsinki Declaration.
- 2. When reporting experiments on animals, indicate whether the institution's or a national research council's guide for, or any national law on, the care and use of laboratory animals was followed.

Statistics:

- a Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results.
- b- References for the design of the study and statistical methods should be to standard works when possible rather than to papers in which the designs or methods were originally reported.
- c Specify any general-use computer programs used.
- d Determine the significant level.

Findings (Results)

- What did you find?
 - (Tables, Charts, Tests, Text)
- Logical Sequence
- Importance and Accuracy
- Mean (SE or SD)
- Median (IQR)
- Frequency (%)
- P-Values for tests
- Confidence Intervals
- Table and Figure Characteristics

Results

- Start with the results that are easier to interpret
- Results should be set out in tables and figures
- Do not duplicate illustrations
- Tables and figures must be straight forward
- A lot of numbers, make Table
- Provide relevant statistical information
- Do not repeat data in the text
- Logical sequence: Text, Tables, Figures

Figures

- Choose an appropreat chart
- Informative
- Axes
 - Minimize tick marks
 - Don't number each tick
- Legend
 - Gives message

Tables

- Well labeled
- Not too complicated
- Understood without text
- No added vertical/horizontal lines
- If small, move data to text

Results

- 1. The results is the central core of the article.
- 2. Describes some characteristics of the study and society (without repeating the details).
- 3. Showing the main results according to the goals.
- 4. The verbs of the sentences must be in the past tense.
- 5. Findings include text, tables, graphs and tests.
- 6. The simplicity and clarity of the results is important;
- 7. Charts and tables should be understandable and expressive.
- 8. The number and title of the tables are above and for the charts are below;
- 9. If the data is analyzed, it should be determined whether it is meaningful or not;
- 10. The numbers of figures or tables should be given at the end of the sentence in the text.

- Interpret results:
 - Did the study confirm/deny the hypothesis?
 - If not, did the results provide an alternative hypothesis?
 - What interpretation can be made?
 - Sources of error/anomalous data?
 - Implications of study for field.
 - Suggestions for improvement and future research?
 - Do results agree with other research?

How well are the results related to other research on the same topic?

- In the discussion section, is there a review of how these results compare or contrast with prior research?
- If this report found something different from previous research, then it's important to question on appraising the reliability of the findings.

- Linking results to original purposes and hypotheses
- Why the results turned out the way they did
- Identifying the study's limitations
- Suggesting steps for further research

- Discussion tell a story on their own.
- Gaps are pointed to.
- Ability to clarify the differences if any.
- The conclusions follow from the work described?
- The last sentence should be the conclusion

Evaluating Discussion

- Consistency of Discussion with findings
- Appropriateness of generalizations
- Discussion of implications of findings
- Discussion of limitations of study
- Alternative explanation for findings
- Linkage of Discussion with theoretical framework, research questions

Questions to Ask implications

- What are the implications?
 - The whole use of research is how far the results can be generalised.
 - All authors will tend to think their work is more important than the rest of us!
 - What is new here?
 - What does it mean for health care?
 - Is it relevant to my speciality?

Common Mistakes

- Combined with Results
- New results discussed
- Broad statements
- Incorrectly discussing inconclusive results
- Ambiguous data sources
- Missing information

Consider if:

- 1- It covers all findings presented in "Results".
- 2- The data are compared with reports of others.
- 3- The comparisons are rational.
- 4- References are relevant and recently published.
- 5- Irrelevant discussions are not included.
- 6- Discussion is not redundant of results.
- 7- It encompasses a logic volume.
- 8- Include a conclusive final part.

- 1. Mentioning the main results and their relationships that are mentioned in the findings;
- 2. Mentioning any point that is related to the obtained results or that these obtained results are far from expected;
- 3. Comparing the results with other studies,
- 4. Possible justification of the differences between the studies,
- 5. Mentioning the mechanism of intervention effect or relationships between variables
- 6. Theoretical findings and their scientific applications;
- 7. Mention of suggestions:
 - 1- About the topic of the article and
 - 2- Regarding further studies,

Conclusion

- 1. A very brief summary of the discussion,
- 2. (limited to one paragraph).
- 3. Only the most important results according to the main objectives of the study.
- 4. Without bringing numbers and tables.
- 5. The reader is assigned a task.
- 6. It is not necessary to write the P-value.
- 7. Reference writing is not necessary.

Conclusion

- It covers main findings after comparison with other studies in discussion and important recommendation.
- Without refer to the references.
- Without detail of result and P-value.
- Consistency of conclusions with findings
- Linkage of conclusions with research questions

Acknowledgment

- Who?
- What?
- Source of funding
- Conflict of interests
- Permission

Acknowledgments

- 1. The authors would like to thank their colleagues, project guides, companies or organizations that provide project costs, typists, etc.
- 2. The authors are obliged to mention and thank them in this section only after obtaining (written) permission and the consent of the individuals (especially in the case of named individuals).
- 3. The names of the authors should not appear here.

References (Bibliography)

- Are the references and citations formatted properly? (Vancouver or Harvard style)
- Are the references "fully formed"?
- Are they retrievable?
- If you find statements in the paper which you consider to be important check that a reference is provided.
- Be suspicious if no reference is given, or if the references which are provided are dated, or predominantly in obscure journals.

References Methods

- 1. MLA: American Modern Language Association
- 2. Chicago method
- 3. IEEE
- 4. Vancouver method
- 5. APA (American Physiological Associations)
- 6. Harvard method
- 7. ACS (American Chemical Society)
- **8.** AIP (American Institute of Physics)
- 9. ALWD (Association of Legal Writing Directors)
- 10. AMA (American Medical Association)
- 11. AMS (American Mathematical Society)
- 12. AP (Associated Press)
- 13. APSA (American Political Science Association)
- 14. ASA (American Sociological Association)
- 15. ASABE (American Society of Agricultural and Biological Engineers)
- 16. ASME (American Society of Mechanical Engineers)
- 17. Bluebook (Harvard: Law)
- 18. CSE (Council of Science Editors)
- 19. Government information
- 20. GSA (Geological Society of America)
- 21. NLM: National Library of Medicine

References

- 1. In an article, you should use only one method (Vancouver or Harvard or...);
- 2. In the Vancouver method, the number of each reference is written in parentheses in the text or above the relevant text, and the references are listed in the order they are written in the text, at the end of the article (mentioning the number).
- 3. In the Harvard method, writing the author and the year of publication of the article (in parentheses) in the text and bringing the references at the end in the order of last name or year.
- 4. Never cite the sources of another article as the source of your article.
- 5. In the article, all the references mentioned at the end of the article must be used and Vic versa.
- 6. The address of the sources should be written completely (the relevant principles are given in the guide for the authors of the journals).
- 7. Informal lectures cannot be used as a source of material.

Software for references

- Mendeley
- Zotero
- Citavi
- EndNote
- RefWorks
- Reference Manager

"Those who have the most to say, usually say it with the fewest words"

Types of articles

- 1. Scientific or Original article
- Review paper
- 3. Meta Analysis
- 4. Conference Report
- 5. Meeting Abstract
- Case Report
- 7. Brief Report or Short
- 8. Letter to the Editor
- 9. Editorial
- 10. Personal Views
- 11. Special Communicat



Letter to the Editor:

- 1. Letter to the editor may be:
 - 1. Expert opinions,
 - 2. Readers' suggestions,
 - 3. Criticisms about the latest articles published in the journal, or
 - 4. Summaries or parts of research results.
- 2. The total volume of the letter to the editor is between 1 and 2 pages (maximum 500 words).
- 3. The letter to the editor has the main text without sub-headings and usually without tables and diagrams.

Structure of the letter to the editor (for research)

- 1- Title: Like other articles.
- 2- Authors: Like other articles
- 3- Main text: Include:
 - 1. Short introduction (the reason for writing a letter, such as time urgency, etc.),
 - 2. Summary of the methods,
 - 3. Findings (the most important part of the main text), and
 - 4. Conclusions.
- 4- References: (maximum 5 sources).

Structure of the letter to the editor (for comment)

- There is no need to follow the research structure when commenting.
- Usually, in such cases, the introduction refers to the material written in the journal that is going to be criticized, and its characteristics.
- Then, the problems on the content are mentioned in a detailed and documented manner.
- Then the opinions of the author of the document are mentioned to the sources about the desired content.
- At the end, suggestions may be made.

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Case Report

- Description of one or more (2 or 3)
 rare or unusual cases of diseases or
 unusual events.
- The case report can be a basis for hypothesis and new researches.
- Journals such as the Lancet and the New England Medical Journal publish at least one case report in each of their issues.

Structure of the case reports

1- Abstract (some journals):

- 150-100 words,
- Reason for referral,
- Introduction of the patient, and
- Results.

2- Introduction (some journals):

- Writing in one or two paragraphs compactly,
- How to draw the attention of the "case" to the mind of the writer,
- Major features,
- Review of texts (brief reference), and
- The reason for being unique or unexpected.

Structure of the case reports

3- Case or patient description:

- Introduction of the patient, age, sex, reason for referral, history, clinical data, laboratory data, interesting points in clinical and laboratory examination, treatment results and the end of the work.
- Using the picture of the patient (observing ethical points)
- Adding findings related to the patient's family after the case description.

4- Discussion and conclusion:

- Comparison with the results of other reports and providing evidence of its novelty.
- Logical and scientific discussion and interpretation about achieving such results.
- Avoid repeating the material presented in the patient introduction section.

5- References:

Types of articles

- 1. Scientific paper (Original article)
- 2. Review paper (systematic review)
- 3. Meta Analysis
- 4. Conference Report
- Meeting Abstract
- 6. Case Report
- 7. Brief Report (Short Commun
- 8. Letter to the Editor
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Systematic review is a research approach:

- Choosing a regular method for retrieving original articles
- Determining criteria for selecting or rejecting articles
- Selection of articles based on established criteria
- Studying, evaluating and criticizing selected articles
- Writing the main article
- Attention to the characteristics of a systematic review article.

Features of a systematic review article:

- The subject of the article is a specific clinical aspect, it is not general.
- The references are very comprehensive.
- The references have been retrieved with a systematic and clear search method.
- The clear criteria for selecting articles and their contents are predetermined.
- The criteria are used for all information and articles in the same way.
- Usually, accurate numerical information is used in the conclusion section.
- If statistical analysis methods are used on the data, the article is meta-analysis.

Review Article

1- Abstract:

- **75-100 words**
- Introduction of the subject and what sources have been revised from what date to what date.

2- Introduction:

- ➤ Introduction of the disease and what is known and unknown about it.
- > Explanation of the purpose of the article

3- Methods:

- Description and introduction of the sources used
- Databases of obtained sources
- Time period of review of sources in the article
- The language of books and publications used
- Definition of important words and terms of the article
- How to collect information from different articles for scientific conclusions,
- How to generalization in meta-analysis articles.

4- The main part (sequence of parts):

- Etiology
- Pathogenesis
- Clinical, radiological and laboratory manifestations
- Diagnosis
- treatment
- Prognosis
- Final conclusion

Another type of sequence of parts:

- Organizing content from general to detailed
- According to the classification of subjects

Example: Evaluation methods of medical students

- Oral methods
- Written methods
- Comparison of validity of these methods
- Etc.
- The final conclusion

- A systematic review article is a review that answers a good clinical question, "Well formulated clinical question".
- Characteristics of a good clinical question:
 - 1- A question that considers a specific target group in clear conditions (for example, "patients over 60 years old who visit the outpatient clinic").
 - 2- It has a specific issue (such as high blood pressure).
 - 3- It considers a type of test or special treatment (for example, pharmacological treatment).
 - 4- Considers one or more specific outcomes related to the above cases (such as cardiovascular complications or death).
- Pay attention to the following example:

"Does the pharmacological treatment of high blood pressure in patients over 60 years of age reduce cardiovascular complications or lead to a reduction in mortality?"

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- 6. Case Report



- 8. Letter to the Editor
- 9. Editorial
- 10. Personal Views
- 11. Special Communications



Brief Report

- What is the short report made of?:
 - 1) From ongoing original research
 - 2) new and important results of scientific research.
- The short report is 1200 (1000 to 1500) words.
- Sometimes, instead of 4 main parts, the original article has one main text.

Brief Report

These manuscripts are short reports of:

- original studies
- evaluations
- unique, first-time reports of clinical case series.
- Recommended length: 1000-1500 words
- no more than a total of 3 tables or figures.
- no more than a 15 references



Parts of brief report

- 1) Title,
- 2) Authors,
- 3) Abstract (100-150 words),
- 4) Main text,
- 5) Maximum (1-3 tables or graphs),
- 6) Acknowledgments, and
- 7) References (10-15 sources).

The most important reasons for rejecting articles (signs of a bad article):

- 1- The contents are not suitable for the readers.
- 2- Weak content writing,
- 3- Content not being important,
- 4- Inaccuracy of the study,
- 5- Weak research plan,
- 6- Content not being documented,
- 7- Very technical content,
- 8- Repetitiveness of the subject,
- 9- Writing with old typing tools,
- 10- There are many editing errors,
- 11- Existence of unbelievable claims and
- 12- The first two paragraphs are incomprehensible.

What is the solution?

- Rejection of an article does not always mean that it is not good, but usually because there is too much competition for limited space in journals.
- Every research paper is revised at least once.
- Some researchers think that the request for revision is equivalent to rejecting the article.
- If you are asked to make corrections in the content, it is necessary to make these corrections as much as possible, or in some cases, provide some explanation.
- If you don't want to revise your article, you can send it to another journal.

"There is no way to get experience except through experience."





Resources

Day, RA. "How to write and publish a scientific paper," 7th edition, Oryx Press, 2008.

Fischer BA, Zigmond MJ. "Components of a research article." survival@pitt.edu

Marshal GS. "Writing a peer reviewed article." http://dor.umc.edu/ARCHIVES/GMarshallPublishingarticle.ppt

Hall, JE. "Writing research papers (and getting them published)" http://dor.umc.edu/ARCHIVES/GMarshallPublishingarticle.ppt

Benos, D., Reich, M. "Peer review and publication in APS journals." http://www.the-aps.org/careers/careers1/EBSymposia/Benos2003.ppt



Thank you & Good luck

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