Chapter-17

How to write a Review Article?

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A review article is "a critical, constructive analysis of the literature in a specific field through summary, classification, analysis, comparison."[1] A review article is not considered as a primary original research study and is not given due credit for promotion of faculty in various academic institutions in Pakistan. However, review articles are usually written by the subject experts to provide up-to-date knowledge about the topic and merit significance in scientific literature.[2] Review articles may or may not be solicited by the journal editors, and authors are advised to contact the editorial office of the target journal before writing a review article.

Review articles are mainly categorized into systematic review and narrative (non-systematic) review. Both review types are retrospective, observational studies and are prone to random and systematic errors (bias).[3] Systematic review is "a review of the evidence on a clearly formulated question that uses systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyze data from the studies that are included in the review".[4] In contrast, the narrative review is a traditional review of literature in which authors use "informal and subjective methods to collect and interpret information".[5]

Both systematic review and narrative review have distinctive methodological features.[3,6-9] Question to be answered is very specific & narrow in systematic review and very broad and covering

a wide range of issues in narrative review. Criteria for selection of studies are very clear, stringent and pre-defined and methods used are very specific, rigorous and reproducible in systematic review as compared to narrative review. In systematic review, search strategy is very systematic and comprehensive including sufficient details to replicate the study while in narrative review search strategy is unsystematic, superficial and potentially biased. Studies identified are critically appraised and findings are synthesized, presented and interpreted systematically in systematic review. In narrative review, relevance and validity of the included studies are not assessed against a set criteria and evidence presented may be selective and biased to support any specific viewpoint.

NARRATIVE (NON-SYSTEMATIC) OR TRADITIONAL REVIEW ARTICLE

Although narrative reviews are more commonly published than systematic reviews,[10] there are no standardized or widely accepted guidelines for narrative reviews as for systematic reviews. However, following the pattern of systematic review, especially the search strategy and appraisal of the research, will reduce the bias and improve the quality of narrative review.[11] Various journals have adopted their own format for narrative reviews[12,13] and authors should follow the instruction to authors of the target journal for the details.

Structure of a typical narrative review article:

* Abstract (structured/ un-structured)
* Introduction & Background
* Methods
* Review/Observation & Discussion
* Conclusions/Summary
* References

Limitation of words, tables, figures and references (varies from journal to journal)

* ***Length of Text:*** Usually 2000 to 3500 word
* ***Tables &/or Figures:*** ≤ 5
* ***References:*** 50-75

TITLE:

Title should be concise, informative and should mention "A narrative review" or "A Review" as subtitle.

ABSTRACT

Abstract may be structured or unstructured, depending upon the journal's format. Abstract should be written in the past tense, with active voice communication and does not include any references to the literature, tables or figures.

Structured Abstract: (< 250-300 words) Format of structured-abstracts for narrative review is variable among various journals and includes following sub-headings:

Background/ Importance**:** State the context and overview of the problem and its significance that prompted the review.

Objective**:** Give the main purpose for conducting the review.

Methods**:** Briefly describe the methods used to review and evaluate the literature.

Results /Observations**:** Present the main observations and findings of the review.

Conclusions and Relevance: Conclusion should be based on findings of the review described in the abstract. Indicate the relevance and key implications of the findings for clinical use, policy development and future research.

Unstructured Abstract: (< 250-300 words)

It almost contains the same information as structured abstract but there are no subheadings. It includes the context & objective of review; methods of literature search; summarized important findings, conclusions and recommendations for future research and clinical practice.

KEY WORDS*:* Use MeSH (Medical Subject Headings)[14] key words

INTRODUCTION & BACKGROUND (150-250 words)

Introduction is usually written in 2-3 paragraphs. In start of the introduction, author should highlight the context and significance of the topic, issue, problem or area of concern under review. Focus should be on the relevance and importance of the problem for public health, clinical practice or health policy. It should be followed by an overview of relevant literature to highlight the existing state of knowledge about the specific aspect of the problem. In next paragraph, identify the gaps in knowledge which this review is going to fill. This will provide rationale and justification of the review. In the last paragraph, give clear statement about the objective of the review to answer the question being addressed in review.

METHODS (150-250 words)

Although methods section is usually not essential in narrative review, however it should be preferably included for better reporting of research problem and literature search. Details of search strategy should include

* The process to identify, select, and evaluate the literature
* Electronic databases and other sources used to conduct the literature search (e.g. MEDLINE, CINAHL, EMBASE, Scopus, Web of Science, journals and other search engines etc)
* Search terms and keywords (MeSH)[14] used for literature search
* Eligibility (Inclusion/exclusion) criteria for selection of studies including study types, languages and cutoffs dates of literature search.

REVIEW/OBSERVATION & DISCUSSION (1000-1250 words)

In systematic review, comprehensive data analysis is presented in results section and findings are discussed separately. However, evidence and opinion are mixed in narrative review.[15]

In most of the journals, data analysis and discussion of main findings are merged together in narrative review.

There is no meta-analysis in narrative review and qualitative analysis may be done on chronological, conceptual or thematic basis.[16] Quality of articles selected for review should be critically appraised. Data synthesis should be done by summarizing the results of selected literature and may be presented in tabulated form. Key and fundamental findings to address the main objective of the review should be highlighted and any variation in the results of the studies should be critically evaluated.

Discussion should be based on the logical interpretation and significance of the findings of the review. Focus should be on the main findings relevant to the research problem. Discuss the conflicting results if any, and identify the biases and methodological differences among studies, contributing for the disagreement in results. Give arguments in favour and against the statement developed from review about the research problem. Describe the strengths of the review and how the findings of the review will add to the existing state of knowledge. Reveal the main limitations of the review and identify the unresolved issues and other gaps in the knowledge for future research.

CONCLUSION

Conclusion is sometimes incorporated in the last paragraph of discussion and at times is written under separate heading. In this section, a brief description of major findings is presented and in the light of the available evidence, a clear statement about the research problem should be given. Highlight the significance and potential implications of the review findings for clinical practice, public health or policy development. Limitations of the current review and future directions for research to address the unanswered questions should be stated in conclusion section, if it is given under separate heading.

SYSTEMATIC REVIEW ARTICLE

Systematic review and meta-analysis are considered on top in hierarchy of evidence-based medicine. Systematic review may or

may not include meta-analysis. Meta-analysis is "the statistical method of combining the results of two or more studies, to find the average or common effect across those studies."[17] It can help to establish the size of effect and investigate for consistency (homogeneity) or variation (heterogeneity) in effects among various studies.

Unlike narrative review, systematic reviews follow stringent criteria, meticulous structured format; clear, explicit and reproducible methods for conducting, analyzing and reporting of literature review. Systematic reviews by Cochrane, a global independent organization, are recognized as of highest standard and better in quality than non-Cochrane reviews.[18] Cochrane has developed standards for the conduct and report of reviews of interventions. All Cochrane protocols, reviews, and updates are expected to adhere to these methodological standards-The Methodological Expectations of Cochrane Intervention Reviews (MECIR).[19]

In order to prevent inadequate reporting of systematic review, various reporting guidelines are used. Most widely used reporting guideline for systematic review and meta-analysis of randomized trials is PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses).[20] MOOSE (Meta-analysis of observational studies in epidemiology) is another reporting guideline used for systematic reviews of cohort data.[21] PRISMA Statement[20] comprising of a checklist and flow diagram (see annexure), now included in instruction for authors of all major journals has replaced the previously used QUOROM[22] (Quality of Reporting of Meta-analyses) guidelines. Besides reporting, the quality of the systematic review can be judged by various tools like AMSTAR[23] (Assessing the Methodological Quality of Systematic Reviews) and CASP[24] (Critical Appraisal Skills Programme) Systematic Review Checklist.

WRITING A SYTEMATIC REVIEW

Authors are encouraged to consult the instructions for authors[25,26] of the target journal before writing systematic

review. Structure of systematic review article varies from journal to journal. Specific components of a Cochrane review[9] are given in **Annexure-A**.

The basic structure of a typical Systematic Review includes

Abstract (250- 350 words)
Introduction (150-250 words);
Methods (150-250 words);
Results (1000-1250 words,
Discussion (1000 words);
Conclusions (2-3 sentences).

SUGGESTED READINGS

***** Higgins JPT, Green S (editors). Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0 [updated March 2011]. The Cochrane Collaboration, 2011. Available from www.handbook.cochrane.org.

- Cochrane Style Manual. http://community.cochrane.org/style-manual
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ANNEXURE-A: Basic structure for Reporting Cochrane Systematic Review[9]

Cover sheet:

*Title

*Name of contact author

*List of authors for citation

Contributions

Sources of support

Internal

External

What's New

Text

Issue protocol first published

Issue review first published

*Date of last substantive update

Date new studies sought but none found

Date new studies found but not yet included/ excluded

Date new studies found and included or excluded

Date authors' conclusions section amended

Published notes

Plain Language Summary

****Abstract:***

Background

Objectives

Search strategy

Selection criteria

Data collection & analysis

Main results

Authors' conclusions

****Text of review:***

Background

Objectives

Criteria for selecting studies for this review

Types of studies

Types of participants

Types of interventions

Types of outcome measures

Search strategy for identification of studies

Methods of the review

Description of studies

Methodological quality of included studies

Results

Discussion

Authors' conclusions

Implications for practice Implications for research

Acknowledgements

Conflicts of interest

References:

References to studies

Included studies

Excluded studies

Studies awaiting assessment

Ongoing studies

Other references

Additional references

Other published versions of this review

Tables and Figures:

Characteristics of included studies

Characteristics of excluded studies

Characteristics of ongoing studies

Comparisons, data and graphs

Additional tables

Additional figures

Comments and criticisms:

Title

Summary

Reply

Contributors

ABSTRACT

Abstract of systematic review is in structured format and usually contains following subheadings.

* BACKGROUND
* OBJECTIVES
* METHODS (may include further subheadings of *Search Strategy, Selection/ Eligibility Criteria, Risk of bias, Data Collection & Analysis)*
* RESULTS (may need further subheadings of *Included Studies, Synthesis of results, Description of the effect)*
* CONCLUSION

There should be no references, tables or figures in the abstract.

In order to improve and standardize the reporting of abstracts for systematic reviews, PRISMA has developed "PRISMA extension for Abstracts" in 2013.[27] This 12-item checklist (**Annexure-B**) provides an outline of a structured abstract and covering basic and important components of the review.

KEY POINTS

Some journals like JAMA need a separate section **"Key Points"** which is different from abstract and needs to describe following 3 key points: *Question*, *Findings*, and *Meaning* in 75-100 words.[25]

MAIN TEXT OF REVIEW

Main sections of typical Non-Cochrane systematic review are:

* INTRODUCTION
* METHODS
* RESULTS
* DISCUSSION
* FUNDING SOURCES

ANNEXURE-B: The PRISMA for Abstracts Checklist.[27]

Title	*Checklist Item*	*Reported on page #*
1. Title:	Identify the report as a systematic review, meta-analysis, or both.	
BACKGROUND		
2. Objectives:	The research question including components such as participants, interventions, comparators, and outcomes.	
METHODS		
3. Eligibility criteria:	Study and report characteristics used as criteria for inclusion.	
4. Information sources:	Key databases searched and search dates.	
5. Risk of bias:	Methods of assessing risk of bias.	
RESULTS		
6. Included studies:	Number and type of included studies and participants and relevant characteristics of studies.	
7. Synthesis of results:	Results for main outcomes (benefits and harms), preferably indicating the number of studies and participants for each. If meta-analysis was done, include summary measures and confidence intervals.	
8. Description of the effect:	Direction of the effect (i.e. which group is favoured) and size of the effect in terms meaningful to clinicians and patients.	
DISCUSSION		
9. Strengths and Limitations of evidence:	Brief summary of strengths and limitations of evidence (e.g. inconsistency, imprecision, indirectness, or risk of bias, other supporting or conflicting evidence).	
10. Interpretation:	General interpretation of the results and important implications.	
OTHER		
11. Funding:	Primary source of funding for the review.	
12. Registration:	Registration number and registry name.	

For Details of main text of systematic review, follow PRISMA[20] checklist **(Annexure-C)**. This excellent document elaborates the reporting of each section of a systematic review.

Word Limitation varies among individual journals and usually up to 3500 words of text. (excluding abstract, tables, figures & references).

Number of tables and/or figures - 5.

Number of References- 50-75 (Lancet allows to cite 30 articles in addition to studies included for systematic review)

Flow Diagram: PRISMA has developed a flow diagram to document the details of Identification, screening, eligibility and inclusion of studies in systematic review.[28]

Forest Plot: In case of meta-analyses, Forest plot of included studies should be used to display point and interval estimates of each individual study along with an overall estimate of all studies.

"Summary of findings" Table

In Cochrane systematic review, a summary of main findings and quality of evidence is presented in simple tabulated form. This table provides a list of main desirable and undesirable outcomes, burden of these outcomes, magnitude of effect and numbers of relevant studies.[29] Quality of evidence for each outcome in systematic review is classified as high, moderate, low and very low, by adopting the GRADE (Grading of Recommendations Assessment, Development and Evaluation) approach.[30]

ANNEXURE-C: PRISMA 2009 Checklist.[20]

Section/Topic	*#*	*Checklist Item*	*Reported on page #*
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	

Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.
RESULTS		
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.

Study Characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).
DISCUSSION		
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.
FUNDING		
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.

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