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SHRI B. M. PATIL MEDICAL COLLEGE, HOSPITAL & RESEARCH CENTRE, VIJAYAPURA

## A Report on Workshop

**“Systematic Review and Meta-Analysis”**

Organized by

R & D Cell, BLDE (DU)

**Date: 17/6/2023**

**Venue: Dept. of Medical Education.**

**Participants:-58** (Academicians, Faculty, Research Scholars, PG Students from all disciplines)



The workshop started with the welcoming and introducing to the speaker and the team by Dr. Nirmala G, Co-Ordinator, (R & A), BLDE (DU). Dr.M.M.Patil, Director, R & D Cell, BLDE (DU) addressed few words about the important of **“Systematic Review and Meta-Analysis”**. He also briefed about there is consistent demand on academicians to produce good quality research papers. With the help of some characteristic examples and activities, the workshop will serve as a practical guide to the art of writing papers.

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## Objectives of the workshop:

- To summarizing research evidence
- Reproducible method to find answers to a certain research question, by collecting all available studies

## Content covered:

17.06.2023	Timing	Topic
	10.00 AM to 1.30 PM	Systematic Review
	1.30 to 2.30 PM	<b>BREAK</b>
	2.30 PM to 4.30 PM	Systematic Review

## I. Systematic Review:

Systematic reviews and meta-analyses present results by combining and analyzing data from different studies conducted on similar research topics.

- These research methods are powerful tools that can overcome the difficulties in performing large-scale randomized controlled trials.
- However, the inclusion of studies with any biases or improperly assessed quality of evidence in systematic reviews and meta-analyses could yield misleading results.
- Therefore, various guidelines have been suggested for conducting systematic reviews and meta-analyses to help standardize them and improve their quality.

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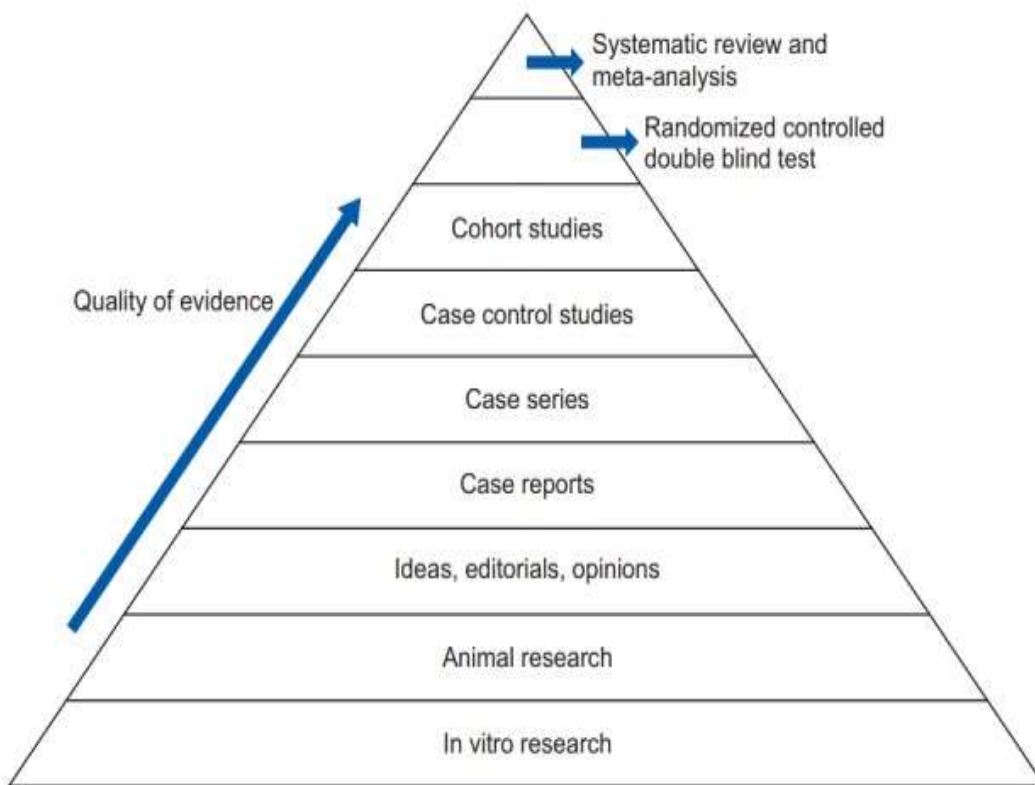


Fig. 1. Levels of evidence.

However, a lack of understanding about systematic reviews and meta-analyses can lead to incorrect outcomes being derived from the review and analysis processes. If readers indiscriminately accept the results of the many meta-analyses that are published, incorrect data may be obtained. Therefore, in this review, we aim to describe the contents and methods used in systematic reviews and meta-analyses in a way that is easy to understand for future authors and readers of systematic review and meta-analysis.

## II. Systematic reviews and meta-analyses usually proceed according to the flowchart presented:



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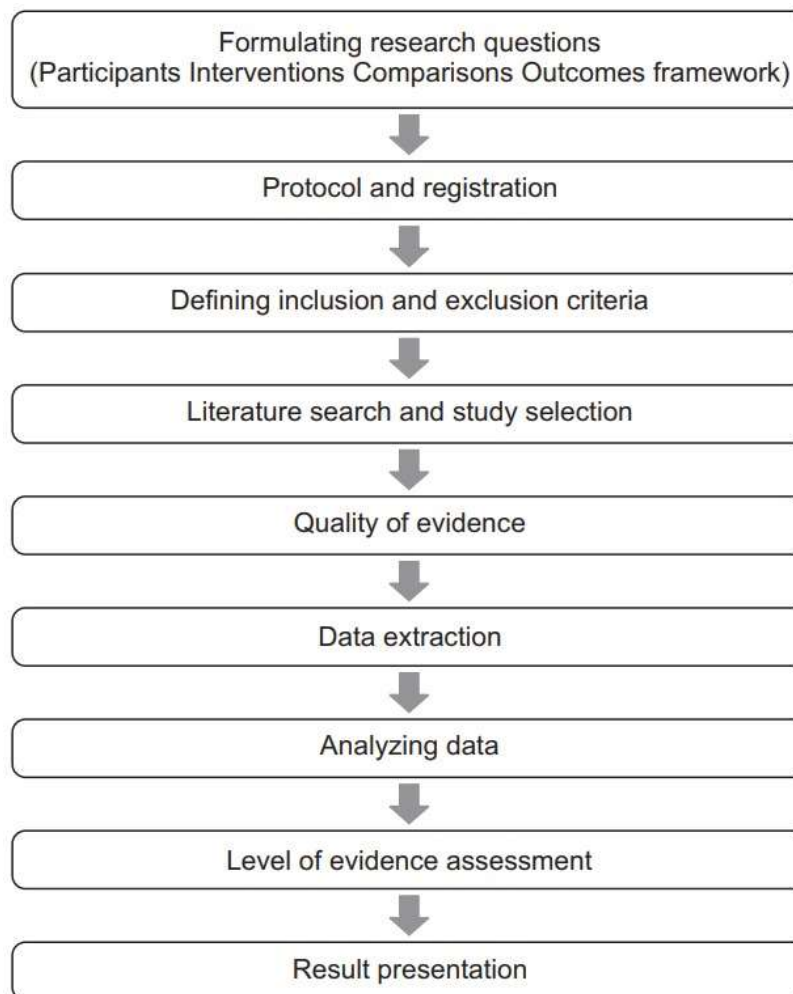
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A systematic review is an objective, reproducible method to find answers to a certain research question, by collecting all available studies related to that question and reviewing and analyzing their results. A meta-analysis differs from a systematic review in that it uses statistical methods on estimates from two or more different studies to form a pooled estimate.



### III. Research Strategy:

- Scoping search
- Identify data base
- Perform key words search
- Document search



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## IV. Research question and objectives

- The research question of SR/MA should be feasible, interesting, novel, ethical, and relevant. Therefore, a clear, logical, and well-defined research question should be formulated. Usually, two common tools are used: PICO or SPIDER. PICO (Population, Intervention, Comparison, and Outcome) is used mostly in quantitative evidence synthesis.

## IV. Preliminary research and idea validation:

Recommend a preliminary search to identify relevant articles, ensure the validity of the proposed idea, avoid duplication of previously addressed questions, and assure that we have enough articles for conducting its analysis. Moreover, themes should focus on relevant and important health-care issues, consider global needs and values, reflect the current science, and be consistent with the adopted review methods.



## V. Inclusion and exclusion criteria

Eligibility criteria are based on the PICO approach, study design, and date. Exclusion criteria mostly are unrelated, duplicated, unavailable full texts, or abstract-only papers. These exclusions should be stated in advance to refrain the researcher from bias.

The inclusion criteria would be articles with the target patients, investigated interventions, or the comparison between two studied interventions. Briefly, it would be articles which contain information answering our research question. But the most important is that it should be clear and sufficient information, including positive or negative, to answer the question.

## Inclusion criteria:

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- (1) Any clinical trial evaluating the safety of Ebola vaccine and
- (2) No restriction regarding country, patient age, race, gender, publication language, and date.

## **Exclusion criteria are as follows:**

- (1) Study of Ebola vaccine in non-human subjects or in vitro studies;
- (2) Study with data not reliably extracted, duplicate, or overlapping data;
- (3) Abstract-only papers as preceding papers, conference, editorial, and author response theses and books;
- (4) Articles without available full text available; and
- (5) Case reports, case series, and systematic review studies.

## **Search strategy:**

A standard search strategy is used in PubMed, then later it is modified according to each specific database to get the best relevant results. The basic search strategy is built based on the research question formulation (i.e., PICO or PICOS).

## **Search databases, import all results to a library, and exporting to an excel sheet:**

According to the AMSTAR guidelines, at least two databases have to be searched in the SR/MA, but as you increase the number of searched databases, you get much yield and more accurate and comprehensive results.

## **Protocol writing and registration:**

Protocol registration at an early stage guarantees transparency in the research process and protects from duplication problems. Besides, it is considered a documented proof of team plan of action, research question, eligibility criteria, intervention/exposure, quality assessment, and pre-analysis plan.

## **Title and abstract screening:**

Decisions to select retrieved articles for further assessment are based on eligibility criteria, to minimize the chance of including non-relevant articles. According to the Cochrane guidance, two reviewers are a must to do this step, but as for beginners and junior researchers, this might be tiresome; thus, we propose

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based on our experience that at least three reviewers should work independently to reduce the chance of error, particularly in teams with a large number of authors to add more scrutiny and ensure proper conduct.

## Full text downloading and screening:

Many search engines provide links for free to access full-text articles. In case not found, we can search in some research websites as ResearchGate, which offer an option of direct full-text request from authors. Additionally, exploring archives of wanted journals, or contacting PI to purchase it if available.

## Manual search:

One has to exhaust all possibilities to reduce bias by performing an explicit hand-searching for retrieval of reports that may have been dropped from first search

## Data extraction and quality assessment:

This step entitles data collection from included full-texts in a structured extraction excel sheet, which is previously pilot-tested for extraction using some random studies. We recommend extracting both adjusted and non-adjusted data because it gives the most allowed confounding factor to be used in the analysis by pooling them later [13]. The process of extraction should be executed by 2–3 independent reviewers. Mostly, the sheet is classified into the study and patient characteristics, outcomes, and quality assessment (QA) tool.

## Data checking:

Due to the expected human error and bias, we recommend a data checking step, in which every included article is compared with its counterpart in an extraction sheet by evidence photos, to detect mistakes in data.



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## Statistical analysis:

Investigators use different methods for combining and summarizing findings of included studies. Before analysis, there is an important step called cleaning of data in the extraction sheet, where the analyst organizes extraction sheet data in a form that can be read by analytical software.

## Double data checking

For more assurance on the quality of results, the analyzed data should be rechecked from full-text data by evidence photos, to allow an obvious check for the PI of the study.

## Manuscript writing, revision, and submission to a journal

Writing based on four scientific sections: introduction, methods, results, and discussion, mostly with a conclusion.

**Conclusion:** When performing a systematic literature review or meta-analysis, if the quality of studies is not properly evaluated or if proper methodology is not strictly applied, the results can be biased and the outcomes can be incorrect. However, when systematic reviews and meta-analyses are properly implemented, they can yield powerful results that could usually only be achieved using large-scale RCTs, which are difficult to perform in individual studies. As our understanding of evidence-based medicine increases and its importance is better appreciated, the number of systematic reviews and meta-analyses will keep increasing. However, indiscriminate acceptance of the results of all these meta-analyses can be dangerous, and hence, we recommend that their results be received critically on the basis of a more accurate understanding.

Systematic review/meta-analysis steps include development of research question and its validation, forming criteria, search strategy, searching databases, importing all results to a library and exporting to an excel sheet, protocol writing and registration, title and abstract screening, full-text screening, manual searching, extracting data and assessing its quality, data checking, conducting statistical analysis, double data checking, manuscript writing, revising, and submitting to a journal.

## FEEDBACK:

- A systematic review attempts to gather all available empirical research by using clearly defined, systematic methods to obtain answers to a specific question.
- A meta-analysis is the statistical process of analyzing and combining results from several similar studies.

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Vote of Thanks by Dr. Chandrika Doddihal, Dy. Director, R & D Cell to Speaker and Participants and offered certificate to the speaker.

## Reported By:

Dr. Nirmala G.  
Co-ordinator, R & A, BLDE (DU).

*[Signature]* 21/6/23

DIRECTOR  
RESEARCH AND DEVELOPMENT CELL  
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### Attendance sheet

Event: WORKSHOP

Date: 17/6/2023

Venue: Department of Medical Education

Topic: Systematic Review & Meta -Analysis

Name	Designation	Mobile Number	Signature
Dr. Pratibha S. J.	Assoc. Prof.	9036110082	[Signature]
Dr. Parvati Demannavar	SR	9731538096	[Signature]
Dr. Ashwini Nachhi	Assoc. Prof.	9986361044	[Signature]
Dr. Sandhya V	Assoc. Prof.	9901665290	[Signature]
Dr. S. S. Kalyankhetkar	Pr. & HOD	9669661960	[Signature]
Dr. M. M. Patil	Pr. Prof.	9900291825	[Signature]
Dr. Sandeep B. Yankarshi	Asst. Prof.	9739638842	[Signature]
Dr. Pallavi Kanthe	Asst. Prof.	8762244309	[Signature]
Dr. Kanika Sachan	PG 2 <sup>nd</sup> year	7206120368	[Signature]
Dr. Shweta. Patil	SR	8217527995	[Signature]
Dr. Upasana Sandhya	2 <sup>nd</sup> year PG	8404036134	[Signature]
Dr. Madhura Sowmya	2 <sup>nd</sup> year PG	8309400854	[Signature]
Dr. S. R. Madhane	Pr. Prof. (OBS)	9668870161	[Signature]
Dr. GANWAMMA APPA PATIL	Med JE-2	9482070998	[Signature]
Dr. Jyoti S. Patil	Asst. Prof.	9986791596	[Signature]
Dr. Smriti Chaudhary	PG 2 <sup>nd</sup> year	8763536621	[Signature]

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Dr. Ashish. S.M	2nd yr med Pg	9036486466	
Dr. Amil Bulgeri	Asst. prof	9445174196	
Dr. Sneha Janakkar	Asst. prof Patho	9008242466	
Dr. Deepak R. Chiranj	Asst. prof	9731962697	
Dr. S. Ramdurg	Prof of med	9511281386	
Dr. Vishwanath. J	Asst. prof	9945126369	
Dr. Chodh Dodder	Asst. Prof	8861060778	
Dr. Shailax pati	prof	9668820666	
Dr. Tanuja Patterkar	Asst. prof	9008581280	
Dr. V. V. V.	prof	9900772903	
Dr. Ishwar. Naralgund	Asst. professor	6363515256	
Dr. Vijaykumari. B. N. Mal	SR	8746046624	
Dr. Shruvan Kumar Patkar	AP	7760747146	
Mrs. Soumya Tungal	phd scholar	7760027612	
Mrs. Akshata Hiremath	Lecturer AHS	8748828360	
Mrs. Geetanjali S. Pujari	Echocardiographer	8884784101	
Gowri. N. Malepatil	PhD scholar	9620213651	
Dr. RAHUL	Analyst	6362401610	
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### RESEARCH AND DEVELOPMENT CELL

**Name of Activity:** Workshop

**Topic:** Systematic review & Meta - analysis

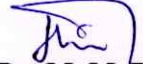
**Date:** 17.06.2023

**Time:** 10:00 am onwards

**Venue:** Medical Education Hall

### Workshop Schedule:

Time	Module	Topics	Resource Person
09:30 am -11:30 am	Systematic review & Meta - analysis	PICO framework	<b>Dr. Ganasoundari</b>
11:30 am – 01:30 am		Search strategy	<b>Dr. M.M. Patil</b>
02:00 pm – 04:00 pm		Prisma flow diagram	<b>Dr. Akram Naikwadi</b>
04:00 pm – 5:00 pm		Risk a bias – Quality assessment tools, Meta – Analysis tools	<b>Dr. Ganasoundari</b>

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