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Research & Biostatistics

for Nurses

As per INC Syllabus



R Sudha

Foreword
S Ani Grace Kalaimathi

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3 Review of Literature

OBJECTIVES

After reading this chapter, you will be able to:

- State the meaning of literature review
- List the purposes of literature review
- Explain the levels of evidence in research
- List the sources of literature review
- Explain the search of literature on the internet
- Explain the practical steps in reviewing the literature
- Enlist the factors to be remembered in doing literature review.

INTRODUCTION

Research can never be done in isolation. Any research is either directly or indirectly related to the existing concepts or work done earlier. A fresh research is theoretically not possible since any research problem is somehow related to the existing concepts. Research studies are undertaken within the context of an existing knowledge base. A careful review of existing resources, such as journals, books, thesis and other related literature is one of the major steps in any research study. It allows the researcher to acquaint and familiarize himself with current knowledge in the area where he proposed to conduct research. A literature review surveys scholarly articles, books and other sources (e.g. dissertations, conference proceedings) relevant to a particular issue, area of research, or theory, providing a description, summary and critical evaluation of each work. The purpose is to offer an overview of significant literature published on a topic.

Meaning of Literature Review

Review of literature can be understood in two different meanings. One is the process of searching for specific content in available literature and the second one is the written summary of the searched content.

In the first context, 'Review of literature' refers to the process of extensive, exhaustive and systemic examination of publications relevant to a specific topic. It is a broad, comprehensive, in-depth, systematic and critical review of scholarly publications, unpublished scholarly print materials, etc.

In the second context, 'Review of Literature' refers to a written report of information gathered from various sources/literature related to a selected topic. This report should be of an evaluative and critical nature and not simply copying from the sources. Such a well-written analytical report forms

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the theoretical base for any research. The primary purpose of writing the report is to personally understand as well as to convey to the reader what is already established on a topic and what are its strengths and weaknesses. It gives an overview of the key findings and key authors, the prevailing theories and hypotheses and methods and methodologies used. In order to write a relevant literature review, the person who writes should remember the research objective, the problems or issues to be researched. Rather, it should not be a descriptive summary of the available information.

Purposes of Literature Review

A literature review may constitute an essential chapter of a thesis or dissertation, or may be a self-contained review of writings on a subject. Reviewing literature can be time-consuming, daunting and frustrating, but is also rewarding. In either case, its purpose is to

- delimit and define the problem
- bring clarity and focus to the research problem
- broaden the knowledge
- know and explain what is already done
- identify any gaps in the previous research
- formulate hypotheses and assumptions
- develop a theoretical and conceptual framework
- decide on research methodology
- develop tool for data collection
- describe the relationship of each work to others under consideration
- identify areas of prior scholarship to prevent duplication of effort
- contextualize the study findings
- identify of experts in the field who could be used as consultants
- to plan intervention or protocol
- to understand and reveal aspects which have and have not been researched
- to understand and overcome problems faced by other workers
- to calculate sample size from previously published data
- to plan for data analysis and statistical methods to be used.

Levels of Evidence

In the process of literature search, we search for the existing evidences or research findings related to the problem of interest. The evidences can range from lowest level to the highest level. It is the researcher who has to decide based on his research problem what level of evidence he has to seek for his problem.

Levels of Evidence in Medical Research

In general, much of the medical research focuses on techniques, drugs and vaccines. It is usually tried on animals and later the efficacy of new drug or vaccine is checked by undertaking randomized controlled trial by comparing with placebo or else with the standard one. Any newer technique or intervention is tried on individual basis and later into a large samples. In nursing, we do not engage in drug trial or test any invasive procedures (Fig. 3.1). The evidence for nursing research can range from case series to meta-analysis (Fig. 3.2).

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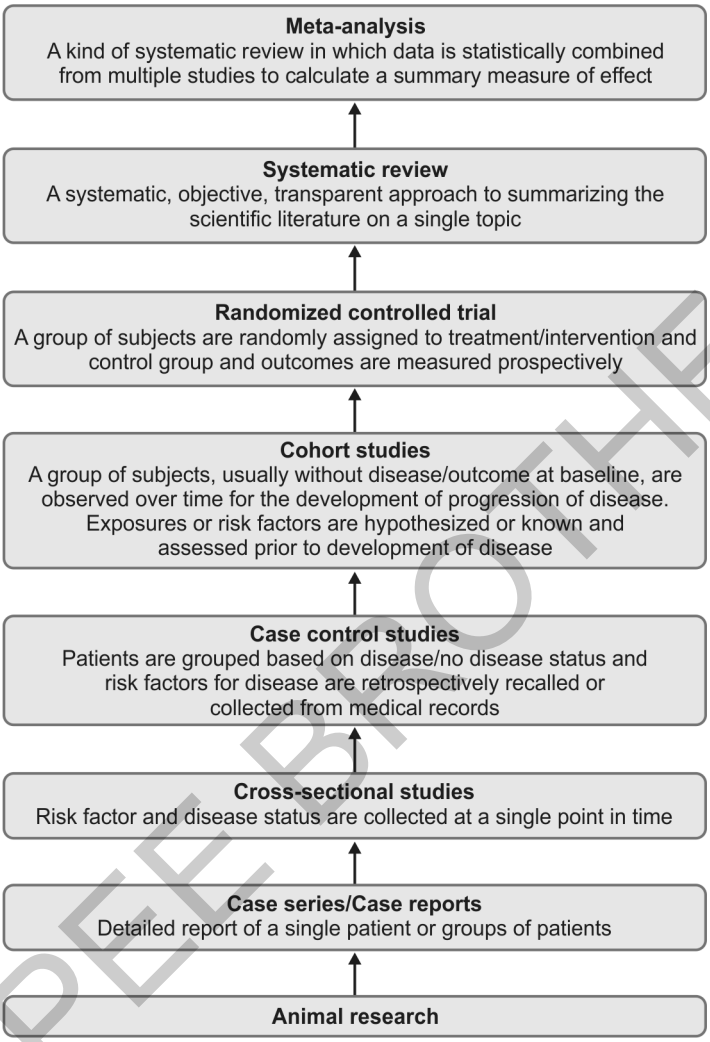


Fig. 3.1: Level of evidence in medical research

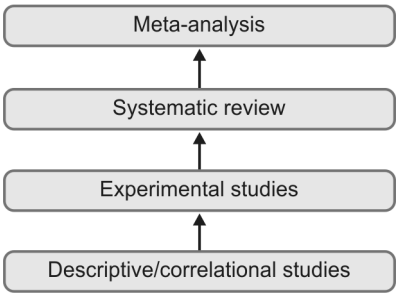


Fig. 3.2: Level of evidence in nursing research

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Sources of Literature Review

- ***Primary source:*** They are descriptions of studies written by the researchers who conducted them. The author reports his own work directly in the form of the research articles, books, monographs, dissertations or theses. Such sources provide more information about a study since it is author's own work. The examples of primary sources are letters/correspondence, diaries, memoirs, autobiographies, official or research reports, patents and designs and empirical research articles.
- ***Secondary source:*** These research documents are descriptions of studies prepared by someone other than the original researcher. The author compiles and summarizes the findings of the work done by others and gives interpretation of findings. The author usually attempts to cover all the important studies in an area. The disadvantage of the secondary sources is that the reader has to depend upon someone else's judgments about the important and significant aspects of the study. The examples of secondary sources are academic journal articles (other than empirical research articles or reports), conference proceedings, books (monographs or chapters' books) and documentaries.

  The decision concerning the use of primary or secondary sources depends largely on the nature of research study proposed by the researcher. If it is a study in an area in which much research has been reported, then a review of the primary sources would be a logical first step. On the other hand, if the study in which little or no research has been conducted, a check of the secondary sources is more logical.

Various sources of literature are as follows:

- ***Journal articles:*** They provide recent and up-to-date information. It is good to review the peer-reviewed journals for its credibility, reliability and relevance. They provide relatively concise reports covering all the important information. There are online journals and journals in print, both of which can be referred to.
- ***Books:*** Books tend to be less up-to-date as it takes longer for a book to be published than for a journal article. Books which are recently published with latest edition are reviewed. E-books are also available on the internet.
- ***Conference proceedings:*** These can be useful in providing the latest research, or research that has not been published. They are also helpful in providing information about current areas of research.
- ***Government/Corporation reports:*** Many government departments and corporations carry out research. Their published findings can provide a useful source of information, depending on the field of study.
- ***Newspapers:*** Newspapers are generally intended for a general (not specialized) audience. The information they provide will be of very limited use for literature review. Often newspapers are more helpful as providers of information about recent trends, discoveries or changes, e.g. announcing changes in government policy, epidemics of any diseases, but one should then search for more detailed information in other sources.

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- ***Theses and dissertations:*** These can be useful sources of information. However, it has its disadvantages. It is not a published work and is available only in the libraries. It is written by students who may not be experienced researchers and, therefore, the findings have to be treated with more caution than published research.
- ***Internet:*** It is the fastest-growing source of information. Anyone can post information on the internet so the quality may not be reliable and the information found may be intended for a general audience. It may be less detailed and not be suitable for inclusion in literature review. At the same time, more and more refereed electronic journals (e-journals) are appearing on the Internet, if they are refereed, it means that there is an editorial board that evaluates the work before publishing it in their e-journal. So, the quality is more reliable.
- ***CD-ROMs:*** These provide kind of specialized, detailed information about academic research and are mostly available for use in academic libraries. So, they can be a very valuable tool in searching for the information we need.
- ***Magazines:*** They provide news or general information about new discoveries, policies, problems, etc. which are intended for a general audience. As newspapers, they can be referred to but detailed information to be collected from various sources. Some specialized magazines may be more useful.

Searching for the Review on the Internet

A researcher can search information using search engines in the internet. A search engine is an information retrieval system designed to help find information stored on a computer system. The search results are usually presented in a list and are commonly called ***hits***. Search engines are programs that search documents for specified keywords and returns a list of documents where the keywords were found. These search engines enable users to search for documents on the World Wide Web. Web search engines work by sending out a spider to fetch as many documents as possible. Another program, called an ***indexer*** then reads these documents and creates an index based on the words contained in each document. The examples of search engines are as follows:

- Google
- Yahoo
- Bing
- Altavista
- Go
- Ask
- Aol
- mywebsearch
- info
- Webopedia

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A database is an organized collection of data. A structured set of data held in a computer, specially one that is accessible in various ways. Examples of databases:

PubMed

MEDLINE (Medical Literature Analysis and Retrieval System Online, or MEDLARS Online) is a bibliographic database of life sciences and biomedical information. It includes bibliographic information for articles from academic journals covering medicine, nursing, pharmacy, dentistry, veterinary medicine and health care. It is compiled by the United States National Library of Medicine (NLM) at the National Institutes of Health (NIH). MEDLINE is freely available on the Internet and searchable via PubMed and NLM's National Center for Biotechnology Information's Entrez system. PubMed is a free search engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics.

MeSH is the acronym for 'Medical Subject Headings'. It is a list of vocabulary terms used for analysis of biomedical literature by the NLM. MeSH vocabulary is used for indexing journal articles for Index Medicus® and MEDLINE and is also used for cataloging books and audio-visuals. One must know about the Boolean logic. Boolean logic symbolically represents relationships between entities. There are three Boolean operators:

1. And
2. Or
3. Not

It can be used in the following ways in advanced search at PubMed. Suppose we enter 'diarrhea and dehydration' in the search column in the PubMed, the search details appear as follows:

(diarrhea [All Fields] OR diarrhea [MeSH Terms] OR diarrhea [All Fields]) and (dehydration [MeSH Terms] OR dehydration [All Fields]) and (Clinical Trial[ptyp] and 2004/01/01 [PDat]: 2013/12/28 [PDat])

Suppose if we enter 'diarrhea or dehydration' in the search column, the search details appear as follows:

(diarrhea [All Fields] OR diarrhea [MeSH Terms] OR diarrhea [All Fields]) OR (dehydration [MeSH Terms] OR dehydration [All Fields]) and (Clinical Trial[ptyp] and 2008/12/30 [PDat]: 2013/12/28 [PDat])

Suppose if we enter 'diarrhoea' and not 'adults', the search details appear as follows:

(diarrhea [All Fields] OR diarrhea [MeSH Terms] OR diarrhea[All Fields]) NOT (adult [MeSH Terms] OR adult [All Fields] OR adults [All Fields]) and (Clinical Trial [ptyp] and 2008/12/30 [PDat]: 2013/12/28 [PDat])

We can use filters in advanced search. The articles can be filtered based on:

Article Type

- Clinical trial
- Review

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- Systematic reviews
- Bibliography
- Journal articles, etc.

Text Availability

- Abstract available
- Full text available
- Free full text available.

Publication Dates

- 5 years
- 10 years
- Custom range (One can select the period during which all the articles indexed can be accessed).

Species

- Human
- Animal.

Language

- English
- Other languages.

Sex

- Male
- Female.

Ages

- Child
- Infant
- Adult
- Aged.

There are a few other additional filters one can use in the PubMed advanced search.

Cochrane Library

The ***cochrane library*** is a collection of six databases that contain different types of high-quality, independent evidence to inform healthcare decision-making, and a seventh database that provides information about groups in the Cochrane Collaboration. The Cochrane Database of Systematic Reviews (CDSR) is the leading resource for systematic reviews in health care. The ***CDSR*** includes all Cochrane Reviews (and protocols) prepared by Cochrane Review Groups in the Cochrane Collaboration. Each Cochrane Review is a peer-reviewed systematic review that has been prepared and supervised by a Cochrane Review Group (editorial team) in the Cochrane Collaboration

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according to the ***cochrane handbook for systematic reviews of interventions or cochrane handbook for diagnostic test accuracy reviews***. The topic can be browsed by topics or other browse options.

MedIND

MedIND has been produced under an ICMR-funded project—'National Databases of Indian Medical Journals'. Its purpose is to provide free access to full text of articles published in selected Indian Biomedical Journals indexed in IndMED or PubMed.

Apart from these databases, there are paid/free online journals which can be accessed freely without any subscription. The ***BMJ*** (formerly the British Medical Journal) is an international peer-reviewed medical journal and a fully 'online first' publication. All articles will appear on bmj.com before being included in an issue of the print journal. The website is updated daily with the ***BMJ***'s latest original research, education, news, and comment articles, as well as podcasts, videos, and blogs.

Steps in Searching Literature on Internet

Develop a Search Strategy

The researcher has to develop a search strategy before beginning the search. A search strategy is a plan that helps us to look for the information we need. Start with a focused, answerable question. We can use PICO format.

P Patient or Problem
I Intervention
C Comparison and
O Outcome

Select a High-yield Database

The researcher can choose PubMed, cochrane library, MedIND, etc.

Identify the Key Concepts or Key Words

Determine the alternative terms for these concepts, if needed. Terms like MeSH can be used to search for the sources.

Use Filters

Refine search to dates, study groups, etc. as appropriate. Filters in advanced search can be used to narrow down the search which will be more focused.

Practice Helps

Strategies and styles will differ according to personal choice and professional discipline. Practice facilitates faster search. One must be familiar with the techniques and facilities available in each search engine and databases.

Steps in Reviewing Literature

The major steps involved in reviewing the literature are as follows:

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1. ***Identification of the topic or concepts to be reviewed:*** This requires the researcher to decide on the topic(s)/concept(s) or the content to be reviewed, which is usually related to the research problem. Literature review on the broader area of interest helps the investigator in selection and refining the problem and once the problem is stated, it helps in the review of specific concepts related to the problem being studied.
2. ***Search for the literature:*** This step involves in finding the sources/ materials relevant to the subject being explored. The investigator can search from various sources both primary and secondary from journals, books, newspapers, magazines, dissertations, thesis, internet, etc. In doing so, one must:
   - Prepare a list of journals and books to be reviewed
   - Locate the books and journals
   - Select the latest issue, examine its contents page to find the articles relevant to the study
   - Look at the index of research abstracts in the relevant field to identify and read the articles.
   - Take photocopies wherever necessary.
   - Writing annotated bibliography helps the researcher in identifying the content in the books and journals.
3. ***Data evaluation:*** As the investigator goes through the data from various sources, she has to analyze the credibility of the data, its geniuneness, reliability and accuracy. The investigator can check for the following:
   - ***Authority:*** Who is the author? What are his/her credentials? What is his/her area of expertize?
   - ***Provenance:*** What are the author's credentials? Are the author's arguments supported by evidence?
   - ***Objectivity:*** Is the author's view objective or prejudiced? Is contrary data considered or is certain pertinent information ignored to prove the author's point?
   - ***Persuasiveness:*** Which of the author's information are most/least convincing?
   - ***Significance:*** Are the author's arguments and conclusions convincing? Does the work ultimately contribute to an understanding of the subject?
   - ***Accuracy:*** Whether the information seems to be accurate and consistent with the other reports?
   - ***Usefulness:*** How is this source related to the topic? How current or relevant it is to the topic?
   - ***Reliability:*** Does the information come from a reliable, trusted source, such as an academic journal?
4. ***Analysis and reporting of the data:*** There are many information available in relation to a particular concept. The information may be in support of or in opposition of or may offer alternative ideas. All the available information related to a concept(s) are analyzed and interpreted for the purpose of understanding and communication. This is written as a report

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which includes how each work is similar to and how it varies from the others.

In a nutshell, the researcher must:

- ❐ Write a summary and record it for reference for later use
- ❐ Record the main findings with respect to the theme in question
- ❐ List the main themes that have emerged while reading literature
- ❐ Convert them into subheadings. These subheadings should be precise, descriptive of the theme in question and follow a logical progression
- ❐ Pay attention to methodology, its soundness, the testing procedures, subjects and materials used in the study
- ❐ Note conflicting theories, methodologies and results. Check for any assumptions being made by most/some researchers
- ❐ Evaluate and synthesize the findings and conclusions.

Points to be remembered in reviewing literature: When reviewing the literature:

- Remember the purpose
- Read with a purpose
- Write with a purpose.

Some traps to avoid:

- Trying to read everything
- Reading but not writing
- Not keeping bibliographic information.

Sample Review of Literature

De, De Bruijn, De Weert-van Oene and Strivers (2010) conducted a prospective study to analyze the internet and game behavior of secondary school children. This study investigated the internet and game use of secondary school children, the compulsiveness of their use and the relationship with other health behaviors. It also evaluated the preliminary results of a recently developed school health promotion program, implemented at a secondary school in the Netherlands in January 2008. This program was one of the first to combine seven health behaviors in one educational program and was a pilot project for a case-control study. A total of 475 secondary school children completed an extensive questionnaire before and a year after starting the program. Of these children, 367 were in first, second and third grades; the grades in which the lessons about internet and game behavior were implemented. Questionnaires contained questions about personal information, internet and game use (Compulsive Internet Use Scale), and other health behaviors (alcohol use, physical activity, psychosocial well-being and body mass index, BMI).

The study findings revealed that heavy internet use was significantly associated with psychosocial problems and heavy game use was significantly associated with psychosocial problem and less physical activity. No relationship was found with alcohol use or body mass index. The time spent on internet (hours/day) and the number of pathological internet users increased during the study. The number of game users decreased but heavy

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game use increased. The study concluded that there was an association between heavy internet use and psychosocial problems and between game use and psychosocial problems and less physical activity. They further suggested that a case-control study is needed to further assess the program-induced changes in internet and game behavior of school children.

Devis-Devis, Peiro-Velert, Beltran-Carrillo and Tomas (2009) examined the Screen Media Time Usage (SMTU) of 12–16-year-old Spanish school adolescents (N = 323) and the effects of personal and socioeconomic factors, season and type of day. The research design adopted was a cross-sectional survey, in which an interviewer-administered recall questionnaire was used. Statistical analyses included repeated measures analysis of variance, analysis of covariance and structural equation models. Results showed an average of 2.52 hours per day of total SMTU and partial times of 1.73 hours per day in TV viewing, 0.27 hours per day in computer/video games, and 0.52 hours per day in mobile use.

Four significant predictors of SMTU emerged in this study. Firstly, the type of school was associated with the three media of the study, particularly students from state/public school spent more time on them than their private-schools' counterparts. Secondly, older adolescents (14–16-years-old) were more likely to use computers/video games and mobile phones than younger adolescents. Thirdly, the more accessibility to household technology, the more probably computers/video games and mobile phones were used. Additionally, results revealed that adolescents seemed to be using TVs and computers/video games in autumn than in winter, and more TVs and mobile phones on weekends than on weekdays, specially among state school students.

SUMMARY

- Review of literature refers to an extensive, exhaustive and systemic examination of publications relevant to the research project. It is a broad, comprehensive, in-depth, systematic and critical review of scholarly publications, unpublished scholarly print materials, etc.
- In the process of literature search, we search for the existing evidences or research findings related to the problem of interest. The evidences can range from the lowest level to the highest level.
- There are primary and secondary sources for reviewing the literature. The primary sources are descriptions of studies written by the researchers who conducted them. The author reports his own work directly in the form of the research articles, books, monographs, dissertations or theses. Such sources provide more information about a study since it is author's own work.
- The secondary source documents are descriptions of studies prepared by someone other than the original researcher. The author compiles and summarizes the findings of the work done by others and gives interpretation of findings.
- The various sources are journal articles, books, conference proceedings, Government/ Corporation reports, newspapers, theses and dissertations, internet, CD-ROMs and magazines.

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- A researcher can search information using search engines in the internet. A search engine is an information retrieval system designed to help find information stored on a computer system. The search results are usually presented in a list and are commonly called hits.
- A database is an organized collection of data. Pubmed and Cochrane Library are the examples of databases.
- The major steps involved in reviewing the literature are identification of the topic or concepts to be reviewed, search for the literature, data evaluation, analysis and reporting of the data.

EXERCISE

- Select a topic of interest and review the literature. Write a report of the review.
- Identify various online databases and review the literature on a selected topic of interest.

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for Nurses

Salient Features

- The chapters on Research and Statistics have been organized into two sections
- Each and every step of research process is explained with lot of examples
- Specific learning objectives have been included in all chapters
- Concepts of Research and Statistics are well-correlated with the examples from the field of nursing
- Descriptive and inferential statistical methods are explained in an easy way by using an examples from health and nursing
- Theoretical portions of statistics are well explained
- Many sums are worked out step-by-step for each statistical method. These steps are self-explanatory
- Different formulas are explained and worked out to solve a statistical item
- Questions and exercises are given at the end of the chapters
- Covers all INC syllabus of DGNM, BSc (N), PBBSc (N) and MSc (N)
- A single comprehensive textbook which cover the concepts of research and statistics exclusively.



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