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Editorial

Basics of Research and Publications

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Research is a scientific, systemic, step-wise, original investigations carried out by the researcher/s on a topic/ issue to find out more scientific knowledge and additional or new interesting facts or principles in the concerned field. It is a studious inquiry or investigation through experimentation or examination to discover new facts or in-depth knowledge on known facts or interpretation / revision of established facts.¹

It consists of three main steps: Pose a research question, data collection, data analysis and reporting. Word may have originated from old French word 'recherchier' which means 'search again'. Prime target of performing research to receive novel information along with comprehensive understanding of the subject.

Original Research (Primary Research) is first handed research with original data collection or research material of primary source character. **Peer review** is one of the methods to establish the originality of scientific research before being published in academic journals.

Forms of Research: Three main forms are Exploratory research, Constructive research and Empirical Research.

1. **Exploratory Research:** It is useful for defining or identifying a problem or question.
2. **Constructive Research:** It tests theories and proposes solutions to the problem or question under research.
3. **Empirical Research:** It tests feasibility of solution using the experience and observation-based evidence. There are **two major research designs**

in empirical research. They are Quantitative research and Qualitative research.¹

- a. **Quantitative research:** It is an empirical, observation-based, systemic investigation of quantitative characteristics or measurable properties and phenomena and their relationships with collecting numerical data and further statistical analysis. Such results further helpful to establish causal relationships or existence of association between various independent variables. Qualitative studies include various research designs such as Correlational study design, experimental study design or descriptive (survey) study design. Data collection methods include random sampling, systemic sampling, structured data collection methods.
- b. **Qualitative Research:** It involves the detailed understanding of human behavior, reasons governing such behavior by collecting vast data in narrative formats as words or images or videos, etc. by asking broad questions which further analyzed.
- c. **Mixed type of research** comprises of both types i.e., qualitative and quantitative research.

Non-empirical (Theoretical) research: This approach involves development of theory in opposition to the observation and experimentation. It aims to seek solutions to problems with the help of existing knowledge.¹

Basic and Applied Research: Basic research usually comprising of quest for information without any

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target or specific objective. On the contrary applied research is aimed specifically towards the resolution of current issue of interest.¹

General Steps in research: It includes identification of research problem through need analysis, extensive literature review, specifying the purpose of new research project, formulating a research question, creating a conceptual framework for research project-concept map including a set of hypothesis, research methodology (material and appropriate data collection methods), research ethics, data collection and verification, data analysis and interpretation, data reporting and evaluation, communicating the research findings and giving recommendations, **research publication, scholarship.**

Literature review: Literature review is not just summary of previous published studies. It provides the knowledge about the concerned topic considered for research. This comprises the current scenario of the issue in research, effects of the issue, draws the ideas about the lacunae and about the methodology deployed to perform the research on particular topic. It also enlightens the researcher about the details of analysis used for the statistical significance. This clarifies the picture for the researcher about the topic in discussion and method to perform the study.²

Research Methodology: Outline of this section includes study design (type of study- experimental/ cohort/ case control/ cross sectional and logistical arrangements- prospective/ retrospective/ both), study population (time, place, person, inclusion & exclusion criteria), operational definitions, sampling procedure (convenience/ random/ systemic/ cluster), sample size, data collection procedures (who and how?), data analysis plan (data recording, software used, etc.), data safety and quality assurance plan, informed consent, human subject protection, confidentiality and ethical clearance.

Decision of involvement of target population or a sample to be done at the planning stage by the researcher. Multiple steps while dealing with sample comprises of sample size determination, recognition of sample frame and sampling method selection.³

Sampling methods: comprises of two main groups which are probability and non-probability groups. Probability groups are one in which there is same chance for every individual to get selected for the study while in non-probability group, there is no equal possibility for individual to get selected in the study.⁴

Ethical framework for research: Any research with human participants need to follow international ethical standards. Indian national standards on ethics are also similar to international standards. Researchers need to follow ICMR guidelines 2000 and Revised ICMR guidelines 2006 for any biomedical research involving human beings as study participants. Researcher need to follow the four main ethical principles viz justice, respect to autonomy, beneficence and non-maleficence. Individual written informed consent is mandatory from each study participants. Biomedical research is abided by ethical review by institutional ethics committee for protection of human subjects including vulnerable population such as women, children, etc. and confidentiality; scientific review by scientific committee for feasibility and scientific merits and regulatory review in case of foreign funding, exchange of scientists, etc.^{1,5}

Research Publication: The most vital part of the research is to publish the results. Unpublished written output in printed format or just posted on internet without any peer review is called grey literature. To convert our exhaustive research work into a **scholarship**, it needs to be published in peer reviewed, reputed academic journal.

Types of Scientific Journal Articles: It comprises of original research articles, original review articles, Survey paper, Systemic meta-analysis, case series, case report, short communication, editorial, letters, clinical trial, book review, commentary, etc.

Various steps in publication: It includes an original research work or ready material to publish, choosing a correct journal (journal indexing status, scope, etc.), writing and structuring your manuscript abiding the guidelines of the particular journal, manuscript submission, modification of manuscript, final submission of the manuscript.

Abstract writing: It is a concise, self-contained and accurate summary of a research project. It is condensed version of full manuscript.

Really Good stuff: It is a short-structured report up to 500 words without any tables or figure and with a title of less than 8 words, one reference, four or less authors peer reviewed article. It has three important parts viz. what problem was addressed, what was tried and what lesson was learnt.

Outside the box: It is a short-structured report on innovation in medical education. Tables and figures are not permitted.

Writing Original Research articles: various main parts include introduction, material & methods, results, conclusion, recommendations, references.

Information about the individuals reading our articles can be obtained by using - Google scholar, citation alerts, citation index, journal websites, impact factor, etc.

Publications Ethics: Main components of publication ethics includes ethics review/ breach of confidentiality, fabrication and falsification, authorship, plagiarism, ethics related to submission, conflict of interest.⁶

Ethics committee approval abiding national guidelines is needed for study involving human/ animal as subjects. Individual written consent/ assent is must for any study with human participants. Clinical trials need to be registered with Clinical Trial Registry of India (CTRI). Data confidentiality need to be maintained by investigators. Data should not be shared with any other person who is not an employee of that institution without prior permission of institutional authorities.

Data fabrication (the study results are not generated from the study) or data falsification (study results generated by manipulating the data) are considered to be extremely serious misconduct.

Declaration on contributor ship of author is very important. Authorship implies great responsibility and accountability of the published study besides the credit to author. The International Committee of Medical journal Editors (ICMJE) given four basic criteria of authorship viz. 1) Substantial contribution towards concept, design of study, acquisition, analysis or interpretation of the study data; 2) Drafting the work or contributing for critical revision of important intellectual matter; 3) final version approval; 4) accountability on data accuracy and integrity. Giving guest authorship is one of the publication misconduct. There is no such limit for number of authors provided that there should be significant contribution to the research work/ publication. Simultaneous publications/ duplicate publication are not allowed and considered to be publication misconduct. Plagiarism is considered as serious publication misconduct.

Authors should declare any social, personal, financial or other interests which may directly or indirectly influence the conduct of author in regards to the manuscript.

It is obligatory for researcher to get sanction from registered ethics committee prior to commencement of the research trial which is mentioned in Drugs and cosmetic rules, 2005 by

Government of India as well guidelines given by ICMR. Registration of trial in clinical trial registry is mandatory prior to commencement. Schedule Y also gives information about composition of ethics committee and its code of conduct.⁶

Funding for research: The research in medical science is the need of the hour for improving the current treatment and diagnostic methods. Therefore, it is very essential to strengthen the nation by providing pecuniary support to the researchers and augment the research in medical field. Hence funding is being done by various funding agencies including government or private organizations. Funding especially in earlier phase of professional life is vital for solidification of the research.⁷ The researcher should be always be ready with the proper proposal having proper justification. On receiving the call, the researcher should revise the proposal as per the needs of the funding agency. Funding agency needs to be convinced for funding by providing rationale and novelty of topic along with proper budget justification.

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