

RMM001 - RESEARCH METHODOLOGY(Medical & Health Sciences)

Unit-I: Research Preparation and Planning

8 hours

Objectives of research – Understanding research and its goals. Critical thinking. Techniques for generating research topics. Topic selection and justification. Techniques involved in designing a questionnaire – Methods of scientific enquiry – formulation of hypotheses and testing of the same – Development of a research proposal.

Unit-II: Research Resources

8 hours

Sources of information. Literature search. World Wide Web, Online data bases – search tools. Citation indices - Principles underlying impact factor – literature review – Case studies, review articles and Meta analysis – Record of research review -- Role of the librarian. Ethical and Moral Issues in Research, Plagiarism, tools to avoid plagiarism -- Intellectual Property Rights – Copy right laws – Patent rights.

Unit-III: Academic Writing & Presentation

9 hours

Proposal submission for funding agencies, Elements of Style. Organization of proposals, Basic knowledge of funding agencies, Research report writing, Communication skills, Tailoring the presentation to the target audience – Oral presentations, Poster preparations, Submission of research articles for Publication Reputed to journal, Thesis writing, and Research report writing. Elements of excellent presentation: Preparation, Visual and Delivery. Oral Communication skills and Oral defence.

Unit-IV: Data Collection, Analysis and Inference

11 hours

Basic Statistical Distributions and their applications: Binomial, Poisson, Normal, Exponential, Weibull and Geometric Distributions.

Sample size determination & sampling techniques: Random sampling, stratified sampling, systematic sampling and cluster sampling.

Large Sample Tests and Small Sample Tests: Student-t-test, F-test and χ^2 test and their applications in research studies.

Correlation and Regression Analysis-Time series analysis: Forecasting methods.

Factor analysis, Cluster Analysis and Discriminant Analysis (Basic ideas only).

Principles of Experimentation, Basic Experimental Designs: Completely Randomized Design Randomized Block Design and Latin Square Design. Factorial Designs: 2^2 , 2^3 and 2^4 .

Unit-V:

9 hours

Evidence based medicine - Basis Concepts of translational and applied research - procedures of Clinical trials - knowledge of funding and regulatory institutions.

Helsinki declaration - Familiarity with the ICMR ethical guidelines for biomedical research - Institutional Ethics Committee – functions and powers - informed consent, - Familiarity with the Guidelines for care and use of animals in Scientific research - animal substitution.

Indices of health and nutrition in a community anthropometry - epidemiological research - sample size calculation as applied to medical research - study of environmental impact on the health status.

References

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2. Bijorn Gustavii: How to write and illustrate scientific papers? Cambridge University Press.
3. Bordens K.S. and Abbott, B.b.: Research Design and Methods, Mc Graw Hill, 2008.
4. Graves N, Varma V: Working for a doctorate Toutledge 1997.
5. Graziano, A., M., and Raulin, M.,L.: Research Methods – A Process of Inquiry, Sixth Edition, Pearson, 2007.
6. ICMR, Ethical guidelines for biomedical research on human subjects New Delhi, 2000.
7. Indian National Science Academy, Guidelines for care and use of animals in scientific research New Delhi, 2000.
8. Kirkwood B.R.: Essentials of Medical Statistics, Blackwell Publishers, 2003.
9. Leedy., P., D.: Practical Research – Planning and Design, Eighth Edition, Pearson., 2005.
10. R.Clifford Blair and Richard A.Taylor: Biostatistics for Health Sciences, Pearson Education, Inc., 2009.
11. Walpole R.A., Myers R.H., Myers S.L. and Ye, King: Probability & Statistics for Engineers and Scientists, Pearson Prentice Hall, Pearson Education, Inc. 2007.
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