FROM A QUESTION TO A PAPER

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MAIN TOPICS

• A) Research; Basic components, study types, designs and literature search..etc.
• B) Common problems
• C) Critical appraisal
WHAT IS A RESEARCH

- Pursuit of Knowledge by Intellectual & Moral means, unbiased and with Self Discipline
- Systematic Attempt to Study, & Undertake an Investigation to Establish Facts
- A Structured Inquiry using Scientific methods to solve a problem or establish new Knowledge
PRINCIPLES OF RESEARCH

I. **Observation**: Broad Topic & Narrow it; Ask a Question; Derive an Hypothesis

II. **Design**: Write a Proposal; Define a General Objective & Specific Aims; Describe Your Methods for each Aim

III. **Collect Data**: Responsibly & Ethically and Avoid Bias

IV. **Interpretation**: of Findings, Objectively & Appropriate Statistical Analysis; Publish it and present it to **Critical Appraisal** (yours & Colleagues)
I. OBSERVATION
CHOOSING A RESEARCH TOPIC

• Personal Interest of the Researcher
• Need of the Country e.g. incidence / prevalence of disease
• Priority of Funding Agencies e.g. Research Council, University..etc.
• Availability of Resources & Guidance
• Feasibility e.g. lack of Funds, Limited Personnel Help
A GOOD RESEARCH QUESTION

• Is well defined and focused on the specific Problem – Need for Research?

• Actually tells you and others what it is that you are looking at in particular

• Should be within your range of competence & Reasonable Size

• Lead to Original Contribution
II. STUDY DESIGN
III. COLLECTING DATA
TYPES OF STUDIES

1. **EXPERIMENTAL STUDIES**: Researcher exposes Subjects to some intervention e.g. therapeutic or preventative

2. **CLINICAL TRIALS**: 3 Phases, Blinded or not, Must be Registered

3. **OBSERVATIONAL STUDY DESIGN**: No Intervention by Researcher – Design Study accord. to Existing Situation

4. **MISCELLANEOUS GROUP**: e.g. Reviews, Diagnostic Tests S & Sp., Prognostic Studies, Case Reports & Series, Qualitative Res.
EXPERIMENTAL STUDIES

- It is when Researcher Exposes Subjects to some Factor e.g. a Drug, Procedure etc.
- Randomized Control Trials (RCT) is Most Common Type
- In RCT, Define a Study Group (Healthy or Diseased)
- The Group is Randomly Divided into “Experimental” and “Control” Group
- “Control” may be normal pats. Given Placebo, or similar Disease Rx with Best “Gold Standard” therapy
CLINICAL TRIALS

- Clinical Trial Is A Research Conducted on Human Subjects To Allow Safety And Efficacy Data To Be Collected For A New Drug Or Device
  - Phase I - Safety and Safe Dose & side effects
  - Phase II - Protocol e.g. if effective & dose & safety
  - Phase III - The Test for effectiveness, monitor side effects Vs Standard Care
  - Phase IV - Post Approval studies; long term drug Risk
OBSERVATIONAL STUDY

- **CROSS-SECTIONAL STUDY**: A Snapshot of Prevalence of a Certain Disease in a single Moment in Time

- **COHORT STUDY**: Has Time Dimension e.g. comparing Smoking & non-smokers over time - ? Develop Lung Ca

- **CASE-CONTROL STUDY**: Opposite to Cohort Study. Start with Dis. Pts and Controls and go back Hx in time – e.g. Vaginal Ca now & Hx of Preg. Mothers receiving Estrogen
MISCELLANEOUS GROUP

- **Reviews**, Systemic Reviews, Meta-Analysis & Cochrane Evidence-Based Databases
- **Diagnostic Tests** – e.g. Diagnostic modality, Sens. & Spec. in Certain Diseases or Conditions
- **Prognostic Studies** – A variety of Cohort e.g. Check Lymphoma Pats survival after 5yrs or 10 years
- **Case Reports & Case Series** – Of Interest to Students & Resid.
- **Qualitative Research** – e.g. Pats’ Compliance, Attitude e.g. Attitude to Sex post-HIV; Cancer Survivors’ attitude
IV. INTERPRETATION OF FINDINGS & PUBLISHING

• Collection of Data Must be Complete
• Run Statistics on your Data – objectively
• Discuss your Data Critically
• Search the Literature
REFERENCES FROM THE INTERNET

- What is the Best Medical Database to Search with?
- PubMed; Science Direct; Clinical Trials.gov;
- Google Scholar; Scopus Info Site; Ovid
- Cochrane Database; Others
- Effective Search Terms (MESH Terms) Boolean Operators.
B) COMMON PROBLEMS

• Introduction:
  • Why Is This Study Needed? (Strong Rationale)
  • What Is The Purpose Of This Study?
  • Was Purpose Known Before the Study?
  • What Has Been Done Before And How Does This Study Differ?
COMMON PROBLEMS

• **Methods**

  • Inadequate sample size, non-representative sample, or biases in subject selection or recruitment
  
  • Inadequate controls (random assignment, or well-matched controls?)
  
  • Measurement biases (valid tools? blinded? timing appropriate? follow-up?)
COMMON PROBLEMS

• **Methods:**
  • How were subjects chosen?
  • If Blinded – Single, Double or Triple?
  • Any Control Group; Type & how selected
  • Follow-Up? Drop-Out?
  • Reliability? Compliance?
  • Variables Identified & Analyzed?
  • Statistics? Multi-Center QA assured?
COMMON PROBLEMS

- **Results:**
  - Selection and/or number of statistical tests performed
  - Do the results relate to research questions and the purpose of the study?
  - Do Statistical tests answer the research question?
  - Are actual values reported (Means, Standard Deviations, Frequencies, etc) and not just the results of statistical tests?
  - Are informative and appropriate graphics used to present results clearly?
COMMON PROBLEMS

• **Discussion:**
  • The questions posed in the study are not adequately addressed
  • Failure to link findings to current literature
  • Inappropriate interpretations
  • Failure to critique own work
  • Little insight or direction provided
COMMON PROBLEMS

• Conclusion
  • Are the conclusions justified by the data?
  • Do the authors extrapolate beyond the data?
  • Are shortcomings of the study addressed and constructive suggestions given for future Research?
AUTHORS’ AFFILIATIONS & REFS.

• Is the list of contributors reasonable? Thirty authors of a small study!!!.

• Do authors disclose financial relationships for product endorsement, consulting arrangements, etc?

• Is the List of Refs. Complete or are many important ones missing?
REFERENCES/BIBLIOGRAPHY

• ***1992  JAMA  Evidence-Based Medicine: A New Paradigm . . . by the McMaster Univ. Evidence-Based Medicine Working Group in Hamilton, Can


• http://www.phru.nhs.uk/pages/phd/resources.htm

• Critical Appraisal of the Medical Literature: James A. Hokanson, Ph.D. U. Texas, jhokanso@utmb.edu - a Lecture

• Hurley Research Center – a Lecture
C) CRITICAL APPRAISAL

• Is one of the 5 steps of evidence based medicine (EBM)

• EBM:
  • Is The Practice of Medicine With an Emphasis Towards Relying on the Medical Literature for Clinical Decision Making
  • It Is No Longer Just A Buzzword; It Is Now A Critical Aspect Of Medicine & Expected Of Us
5 STEPS OF EVIDENCE BASED MEDICINE

• **Question**: The Clinical Question/Hypothesis

• **Evidence**: Best Evidence to Answer the Question

• **Clinical Appraisal**: The Evidence for Validity

• **Application**: To Clinical Practice

• **Implementation and Monitoring**: Evaluation for Effectiveness and Efficacy of the Whole Process
3 STEPS OF CRITICAL APPRAISAL

- **Accuracy** (Validity) (Study Design)
- **Worthiness** (Value) (Results Evaluation)
- **Relevance** (Applicability to the Population) (To General & Specific Population)
LEVEL OF EVIDENCE

Adopted from Prof Lamk Al Lamki
PLAGIARISM

• Taking someone's else ideas/work and pass it as one's own.

• Directly quoting actual words or using ideas, opinions, or theories.

• Paraphrasing the words, ideas, or theories.

• Borrowing facts, statistics, or illustrative material.

• Without citations, permission or acknowledgment.

• Plagiarism checkers – online
BASIC REQUIREMENTS IN RESEARCH & PUBLISHING

- Be innovative and indicate significance.
- Communicate clearly & Focus on Key Issues.
- Be Thorough in All Details.
- Sell your idea to Colleagues & to Reviewers.
- Get a Critique of your Draft.
- Get help as necessary in Research & in Publication
- Consider Use of Human Subjects Very Carefully
THE ‘BE’ RULE

- Be Reasonable.
- Be Thoughtful
- Be Yourself & Ask Hard Questions
- Be Self-Motivated and do not wait for Encouragement or Support
- Be Self-Confident with No Need of Self Praise
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