

BASIC STEPS IN THE RESEARCH PROCESS

1. IDENTIFY THE PROBLEM/ TOPIC

This is the most important step, and one of the first in developing a research project. Starting from a broad topic area, the researcher needs to be narrowed down the topic to a specific, one-sentenced statement of the problem/issue to be studied. The research problem can be initially identified from a literature review, from personal experiences, from previous research, from a collaborator's or mentor's project, or through testing theories. It is recommended to choose a topic that really interests the researcher, and is significant to the researcher and the field. The final research question to be investigated should pass the "So what" question:

Feasible

Interesting

Novel

Ethical

Relevant

It is better to state the research problem as a question which demands an answer.

How to Select a Topic

- Choose something that interests you.
- Identify the main concepts of your topic. Generate a list of key search terms for each concept.
- Choose a focus that fits your interest and needs. Is it too narrow or too broad?
- Keep in mind the size of the project. How much time will you need to complete the project?, how much time do you have?
- Consult with your mentor/instructor. Do not try to guess.
- Ask a reference librarian for help.

2. DETERMINE THE PURPOSE OF THE STUDY

The purpose of the study is the justification or the “why” the study is being done or is important. The researcher must state clearly the benefits of doing such project and there must be a rationale of the need of such study for the community, and the use of the results. If the purpose or need of the study is clearly stated in the proposal, the approval of the study will process a lot faster. The purpose of the study sets the context of the study and provides the usefulness of the study in the field.

3. SCIENTIFIC LITERATURE REVIEW

The literature review answers the following:

- a. What is already known about the topic?
- b. Why is the topic important?
- c. What answers would the current study provide?
- d. Cites previous research and points out problems with the topic and indicates what questions remains to be investigated.

Research always builds on previous knowledge. When doing a qualitative or quantitative study, it is mandatory to know what information exists or is out there on the topic under study. It is important to know what has been done on the topic, what approaches have been used which helps the researcher to use the best methodological approach, what results have been published, and what questions remain answered. The literature review also helps to develop a conceptual framework for a study and provide tools (e.g. surveys) that contains variables or measures that could be used later in the study.

4. DEVELOP A THEORETICAL/CONCEPTUAL FRAMEWORK

The selection of a theoretical/conceptual framework helps to define the hypothesis/questions of the research, to interpret the findings, and also it also assists in the selection of the study variables and their definition. Research has a double role when it comes to theories and

5. FORMULATE THE HYPOTHESIS OR RESEARCH QUESTION

Once the researcher has conducted a systematic review of the published literature and/or previous findings, the hypothesis should be stated within a maximum of 2-3 text lines making sure the researcher has covered all of the following criteria: the research has an adequate number of subjects and technical expertise; it is affordable in time and money and manageable in scope; it is interesting to the investigator; confirms, refutes or extends previous findings; it is relevant to scientific knowledge, to clinical and health policy, and to future research directions.

6. POTENTIAL PROBLEMS AND SOLUTIONS WHEN DEVELOPING THE STUDY DESIGN

The research question is too broad	Set a smaller set of variables Narrow the question
Not enough subjects available	Expand the inclusion criteria Eliminate or modify the exclusion criteria Add other sources of subjects Lengthen the time frame for entry into the study Decrease sample size, do Power analysis
Investigator's skills are not sufficient	Collaborate with other investigators with the necessary skills; learn the skills
Too expensive	Consider other study designs Recruit less subjects and measurements Fewer follow-up visits

Not interesting or relevant	Modify the research question
The research plan is vague	State the research question in the very beginning. Write down specific plans for how the subjects will be recruited, what are the variables to be measured, how the data will be entered and analyzed

7. IDENTIFY THE POPULATION

The population is the group of people with a specific set of demographic characteristics.

The study design must identify a specific group of subjects that will be accessible with a convenient cost in terms of time and money, but at the same time is large enough to control random error to generalize the finding to the population.

8. SELECT THE SAMPLE

The sample or study group is a subset of the population defined by specific demographic, clinical, temporal and geographic characteristics available for the study. In cases when the population who meet the inclusion criteria is too large, the researcher will need to go through a selection process. There are 2 types of samples:

1- **Convenience samples**: selects every accessible person who meets the inclusion criteria. It is usually less costly and logistically better.

2- **Probability samples**: selects randomly the study sample to ensure generalizability so that it guarantees that each unit of the population has a specified chance of selection, so it generalizes the results in the study to the general population. This process offers different ways to do a randomized sample:

a- Simple random-sample: selected by enumerating the units of the population and selecting a subset at random.

b- Stratified random-sample: divides the population into subgroups according to characteristics such as sex or race, taking random sample from each of these “strata”. The subsamples in the stratified sample can be weighted to draw disproportionately from subgroups that are less common in the population but of interest to the researcher.

c- Cluster sample: Randomly selects natural groups of individuals in the population (clusters). This selection process is very convenient when the population is widely dispersed.

d- Systematic sample: Enumerates the units of the population (as in a simple random sample), but the sample is selected by a preordained periodic process.

9. DEFINE STUDY VARIABLES/TERMS

Continuous Variables: are quantified on an infinite scale. Variables that have an infinite number of possible values.

Categorical Variables: They can not be quantified but classified into categories. Variables with only two possible values are called **dichotomous**. Variables with more than two values are called **polychotomous**.

Within Categorical Variables there are *Nominal* and *Ordinal*. *Nominal* variables have categories that can not be ordered e.g. sex, blood type, cholesterol. *Ordinal* variables have categories with an order, e.g. pain scale.

10. SELECT THE RESEARCH DESIGN

BASIC STUDY DESIGNS

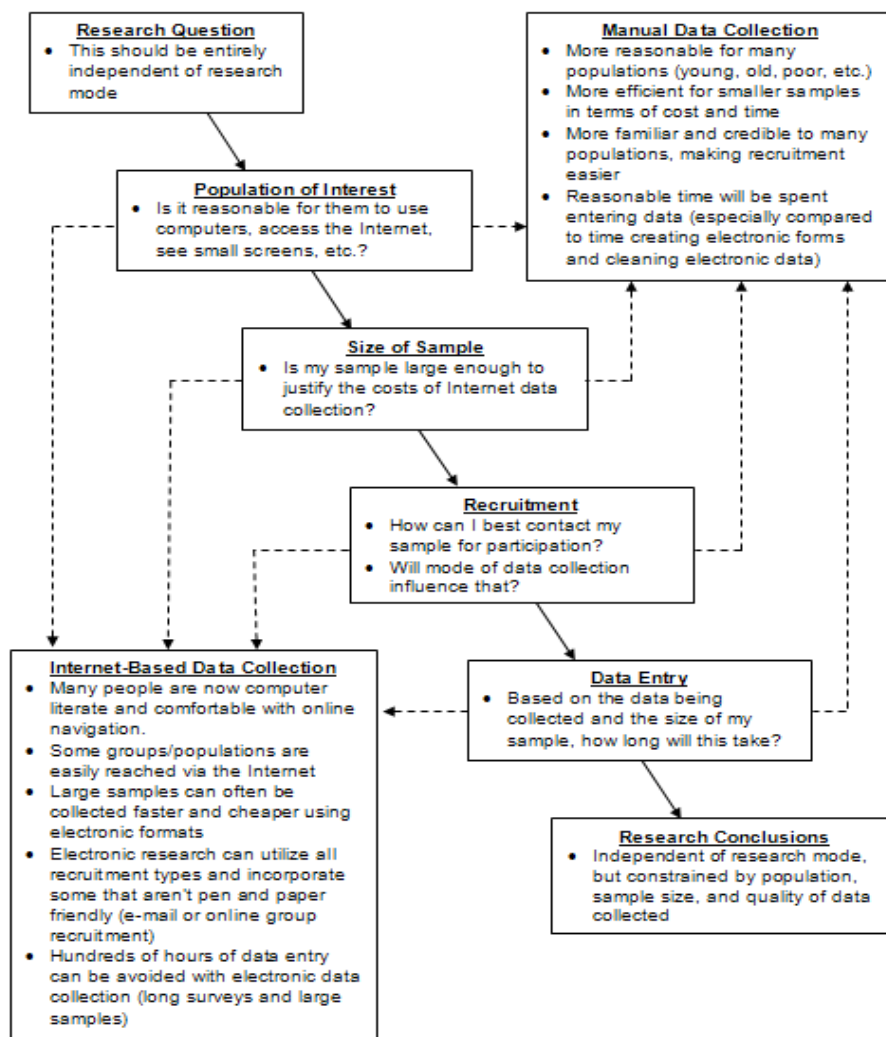
11. CONDUCT A PILOT STUDY

Pilot studies are design to evaluate the cost, efficiency, and feasibility of the study methods, the accuracy of the measurements and reproducibility, and the recruitment rates, outcome rates and effect size.

Pilot studies imply the recruiting of a small number of subjects with a previous developed protocol and IRB approval of the project. The results of a small pilot study can provide valuable information in terms of recruitment design, measurements (surveys) and interventions. It can provide information on response rates and demographics of the population under study. When developing a survey, a pilot study can be very useful to pretest the questionnaires and comprehension of the questions by the subjects.

12. [QUESTIONNAIRE DESIGN](#)

13. **COLLECT THE DATA**



14. ORGANIZE THE DATA FOR ANALYSIS

Data can be entered in a database using any of the statistical software program commercially available. Two of the most common ones are Excel and SPSS (Statistical Package for Social Science). Please contact the [Research Department](#) for more information. Once entered, the database needs to be cleaned and all variables revised.

15. ANALYZE THE DATA

[Using Excel to analyze data](#)

[Excel data entry tips](#)

[Using SPSS](#)

[Entering data in SPSS](#)

[Using SPSS and descriptive analysis](#)

- You can also access the SPSS Survival Manual available at the Synergy library and the Research Department.

16. INTERPRETATION OF FINDINGS

Describing and interpreting data

17. COMMUNICATE THE FINDINGS