Research Proposal
Development
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Introduction

Contents of a research proposal

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The purpose:
to present a concise statement of the subject of the research and to identify the responsible researchers

It should:
express the main message of the research topic, be relevant, be short, be clearly and precisely formulated, be exciting, and be appealing (plus FINER)
1. Select topic of interest

2. Review of literature:
   a. Nutrition experience, nutrition theory, professional literature
   b. State the research problem
   c. Define the research questions

3. Clarify research objectives:
   a. State specific objectives
   b. and/or hypotheses
SELECTING A TOPIC (related to ethical issue):

1. A need to know something that is not already known,
2. To resolve a conflict, or
3. To clarify some piece of information that is not sufficiently documented
THE RESEARCH PROBLEM

1. By sorting through ideas and theories based on other experience and literature

2. To determine:
   a. What we know (Situation and Problem)
   b. What we do not know (Question)
   c. What we need to find (Response)

3. Starts out broad, and concern general nutritional problems or theoretical issues and should become narrow sufficiently to propose a specific question

4. Will provide the foundation for delineating a specific research question
Example-1:

Topic of interest: Exploring issues related to child malnutrition in Indonesia

Research problem: How we can effectively alleviate child undernutrition in Indonesia

This problem could then be addressed in many ways, leading to several different type of studies:

• The effects of feeding center
• The effect of village medicine post
• The effect of Posyandu revitalization, etc
Example-2:

Topic of interest: Exploring issues related to poor exclusive breast-feeding practice in Indonesia

Research problem: Does midwives’ practice and behavior support the current exclusive breast-feeding recommendation?

This problem could then be addressed in many ways, leading to several different type of studies:

• The practice and attitude of midwives
• Factors relating to midwives’ practice and attitude
• The implementation of current exclusive breast-feeding recommendation among mothers
THE RESEARCH QUESTION

Criteria (FINER):

- The question should be important
- The question should be answerable
- The question should be feasible
The question should be important

1. Should have potential impact on treatment, on theoretical foundation or on policies related to practice
2. Should have contribution to scientific knowledge and theory
3. Should be worthy to investigate (should generate new information)
The question should be important

4. How often this nutritional problem occurs in practice
5. Will the finding provide useful information for decision making or be generalized to other situations
6. Will others be interested in the result
The question should be answerable

Question **cannot be** studied scientifically:
Are all malnourished children entitled to treatment regardless of their ability to pay for services?

Revised to questions can be investigated:
1. What is the extent of health service coverage for different socio-economic group?
2. What types of treatment are being denied conducted by local health service facilities?
The question should be feasible

1. Researcher must have the necessary skill, background and resources
2. Consultants and advisors will be sometimes needed for technical and statistical assistance
3. Estimation the time requirement
4. Availability of sufficient numbers of subject
5. Type of space needed
6. Availability of necessary equipment
7. Administration support
8. Budgetary requirement
9. Ethical issue
Target population

1. Refers to the group of individuals to which the results of the study will apply
2. Represents the totally of all members of this group who conform to a designated set of specifications

Example-1:

In studying the effectiveness of a specific program for reducing the prevalence of child malnutrition then we could designate a malnourished children population based on a consistent source of information (anthropometric)
Example-2:

In studying the practice and attitude of midwives toward the current exclusive breastfeeding recommendation then we could designate a midwives population based on a consistent source of information.
PREPARATION FOR RESEARCH

1. Reading published journals to find nutritional problems need to be studied

2. Attending scientific meeting/seminars to see:
   a) how knowledge can be formulated from others’ research findings
   b) how an article presented and criticized
   c) personality of a scientist
   d) healthy democracy among scientists
Causal Model

• Frame of thinking (conceptual framework)
  - All important variables are defined, and their relationship to the central hypothesis is identified;
  - Based on conclusions drawn from the literature (theoretical framework)
  - Closely related to the topic study background
Causal Model

• Helps to identify all important variables that contribute to a hypothesis
• Helps to define the expected cause-effect relationship of the variables
  (if sufficient food intake then improved nutritional status relationship)
• Will form the basis of:
  - Fact-hypothesis matrix
  - VIM
  - Results and discussions
Causal Model-1

Infections

- housing\(^{2.1}\)
- hygiene\(^{2.2}\)
- sanitation\(^{2.3}\)

Care

- knowledge\(^{3.1}\)
- attitude\(^{3.2}\)
- practice\(^{3.3}\)

Intake

- food availability\(^{4.1}\)
- Appetite\(^{4.2}\)

Wasting\(^{1}\)
Causal Model-2

Mother’s exclusive breast-feeding practice

Practice of midwife

Attitude of midwives

Knowledge

Time available

Social pressure

Milk promotion

Profession support

Socio-economic conditions
Objectives

General types of research objectives:

- To evaluate measuring instruments (reliability and validity)
- To describe populations or clinical phenomena (descriptive)
- To explore relationships (risk factors for prevention or treatment options)
- To make comparisons between groups (cause-effect relationship using an experimental model)

Which will frame research design, data collection, and data analysis
Objectives

Criteria:

- Applicable to the situation
- Achievable
- Not ambiguous
- Harmonious with social and institutional goals and constraints
Objectives

The purpose or overall goal(s) of the project

What the project intends to accomplish or develop in relation to observed problems or situations

State specific research results and sequential goals to be achieved
Example-1:

General Objective:

To describe the determinant factors of wasting in relation to infections, care and dietary intake of underfive children in Bekasi
Example-1:

Specific objectives:

1) To determine the prevalence of wasting using anthropometric and clinical indices.
2) To examine acute and chronic infections using laboratory analysis
3) To assess the quality of care using standardized instrument
4) To assess dietary intake using 2 days 24-hour recall.
Example-2:

General Objective:

To investigate the practice and attitude of midwives toward the current exclusive breast-feeding recommendation
Objectives

Example-2:

Specific objectives:

1) To assess the practice and attitude of midwives toward the current exclusive breast-feeding recommendation and it’s relating factors.

2) To investigate the implementation of current exclusive breast-feeding recommendation among mothers.

3) To investigate the relation between midwives’ practice and attitude and mothers’ exclusive breast-feeding practice.
HYPOTHESES

- For exploratory and experiment studies
- Proposed educated guess about the outcome of the study as a statement = hypothesis:
- A declarative statement that predicts the relationships between the independent and dependent variables, specifying the population that will be studied, that provide:
  1) Assistance in planning the design and methods and data analysis procedures
  2) Understanding of what was the researcher expecting to find
Incorporate phrases for hypothesis:
greater than, less than, related to, different from

Criteria for hypothesis:
✓ Must be testable (using statistical tests)
✓ Should be based on a sound rationale (specific)
✓ Can be derived from theory or suggested from previous research, clinical experience or observation (fact or theory)
✓ Brief but clear
HYPOTHESES

Statistical hypothesis = null hypothesis, express no difference or no relationship between the independent and dependent variables:

1) Non-directional Research hypothesis:
   There is no difference in the Care Scale of children with wasting and without wasting
2) Directional Research hypothesis:
   Change score on the Nutrition Care Scale will be higher than change score on the Health Care Scale in a sample of children with wasting

3) Predict a relationship:
   A significant relationship will be demonstrated between total scores on the Care Scale and the indicator of wasting
Simple and complex hypothesis:

Simple: includes 1 independent variable and 1 dependent variable

Complex: contains more than 1 independent or dependent variables that has to be broken down into several simple hypotheses for analysis purposes
Formulation to answer the research questions (scientific problems)
Explaining the problems
Guidance for research methodology and procedures
Guidance to evaluate research procedures
Determine the research steps and confirmations/proves
HYPOTHESIS

Educated guess
Prediction
Causal relationships

That can be tested
\( H_0 \)
\( H_1 \)

Indicate clearly the direction of their relationship
Hypothesis

Criteria:
- Based on known fact/theory
- Testable
- Specific
- Brief, but clear

Type:
- Main
- Specific (part or complement)
Hypothesis

Example-1

Main hypothesis:

There are differences in determinant factors in relation to the severity of child wasting
Specific hypotheses:

1) There are morbidity profile differences in the severity of child wasting
2) There are care scale difference in the severity of child wasting
3) There are dietary intake level differences in the severity of child wasting
FACT-HYPOTHESIS MATRIX

A systematic way to organize causal relationships proposed in the causal model

Each relationship is identified as either hypothetical or proven
<table>
<thead>
<tr>
<th>Variable 1</th>
<th>Variable 2</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 Wasting</td>
<td>infection</td>
<td>SB,2003</td>
</tr>
<tr>
<td>1-3 Wasting</td>
<td>care</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>1-4 wasting</td>
<td>intake</td>
<td>H,2005</td>
</tr>
<tr>
<td>Variable 1</td>
<td>Variable 2</td>
<td>Reference</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>-----------</td>
</tr>
<tr>
<td>1-2 practice</td>
<td>attitude</td>
<td>JF, 2005</td>
</tr>
<tr>
<td>1-3 practice</td>
<td>Social pressure</td>
<td>Hypothesis</td>
</tr>
<tr>
<td>1-4 practice</td>
<td>Socio-economic</td>
<td>K, 1998</td>
</tr>
</tbody>
</table>
A systematic way to organize the relationship between variables of interest and potential indicators of these variables and it should:

- relate every variable of the causal model to at least one indicator

- describe the methodology by which each indicator will be surveyed

- cite the literature source of the methodology selected
RELATIONSHIP AMONG VARIABLES
(variable-indicator-matrix = VIM)

Variable:
A characteristics of the study subjects which is mentioned in the causal model
e.g. Child wasting

Indicator:
Measurement which will be collected during the research that is assumed to reflect the variable
e.g. Anthropometric measurement
RELATIONSHIP AMONG VARIABLES
(variable-indicator-matrix = VIM)

Criteria of VIM (instrument):

1. Validity

2. Feasibility/appropriateness
   a. cost
   b. equipment
   c. methodology:
      1) accuracy: sensitivity, specificity
      2) precision: reliability, reproducibility, repeatability
RELATIONSHIP AMONG VARIABLES
(variable-indicator-matrix = VIM)

Validity:
Measure what we assume to measure (e.g. weight using standardized weighing scale)

Accuracy:
The degree to which a variable actually represents what it is supposed to present (e.g. 50 kg = 50 kg±0.1 kg)

Sensitivity:
The ability to identify and classify those persons who are truly not-healthy or ill (e.g. less or over the BMI normal range cut-off)

Specificity:
The ability to identify and classify those persons who are truly healthy (e.g. normal range of BMI cut-off of 18.5-25.0)
RELATIONSHIP AMONG VARIABLES
(variable-indicator-matrix = VIM)

**Precision:**

The degree to which a variable has nearly the same value when measured several times:

- **Instrument-precision** related to the same sample on different occasion
- **Biological-precision** related to the same subject on different occasions
- **Intra-observer-precision** related to the same tester on different occasions on the same subject
- **Inter-observer-precision** related to different tester on the same subject at the same occasion
• **Reliability:**
  How repeatable measures are (e.g. Weight versus observation of FGD process)

• **Repeatability:**
  Get the same result when we measure the same thing twice or more

• **Reproducibility:**
  Re-measure after an interval of time
Validity implies that a measurement is relatively free from error.
An instrument that is inconsistent cannot produce meaningful measurements.
A valid test is also reliable.
RELATIONSHIP AMONG VARIABLES
(variable-indicator-matrix = VIM)

- Highly reliable but not valid
- Not reliable and not valid
- Not reliable but somehow valid
- Highly reliable and valid
# Relationship Among Variables
(variable-indicator-matrix = VIM)

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Indicator</th>
<th>Method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child wasting</td>
<td>WHZ</td>
<td>Anthropometric</td>
<td>XX, 2004</td>
</tr>
<tr>
<td>2</td>
<td>Infection</td>
<td>White cell blood count</td>
<td>Blood smear</td>
<td>YY, 2000</td>
</tr>
<tr>
<td>3</td>
<td>Care</td>
<td>Scoring</td>
<td>Interview</td>
<td>ZZ, 2005</td>
</tr>
<tr>
<td>4</td>
<td>Dietary intake</td>
<td>Nutrient intake level</td>
<td>Recall</td>
<td>AA, 2005</td>
</tr>
</tbody>
</table>
## RELATIONSHIP AMONG VARIABLES
(variable-indicator-matrix = VIM)

<table>
<thead>
<tr>
<th>No</th>
<th>Variable</th>
<th>Indicator</th>
<th>Method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Mother’s practice</td>
<td>Mother’s ability to lactate, etc</td>
<td>In-depth interview</td>
<td>XX, 1995</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>YY, 2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ZZ, 2004</td>
</tr>
<tr>
<td>1</td>
<td>Practice of midwives</td>
<td>Lactation counseling to mothers</td>
<td>In-depth interview</td>
<td>AA, 2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Observation</td>
<td>AA, 2004</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>BB, 2005</td>
</tr>
<tr>
<td>2</td>
<td>Attitude of midwives</td>
<td>Agreement/disagreement</td>
<td>In-depth interview</td>
<td>CC, 1994</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>DD, 1996</td>
</tr>
<tr>
<td>3</td>
<td>Social pressure</td>
<td>Peer and working place pressure</td>
<td>In-depth interview</td>
<td>EE, 1999</td>
</tr>
</tbody>
</table>
SCIENTIFIC FREEDOM:

Free mentally and physically to:

a. Think
b. Formulate hypotheses
c. Collect and processing/analyzing data

But has to be responsible to:

1) Human being
2) Science
3) Country
4) God
1) How to formulate a research topic?
2) How to construct a causal model?
3) How to formulate objectives?
4) Do you need to formulate hypotheses? Why?
5) How to select an indicator of variable?
6) Based on your causal model, construct your fact-hypothesis matrix and VIM!