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Indira Gandhi
National Open University
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DNHE - 4
PROJECT WORK

PROJECT WORK : NUTRITION AND HEALTH EDUCATION

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Indira Gandhi
National Open University
School of Continuing Education

PROJECT WORK: NUTRITION AND HEALTH EDUCATION

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Course Design

Prof. V.C. Kulandai Swamy
Vice-Chancellor
IGNOU

Prof. H.P. Dikshit
Pro-Vice-Chancellor
IGNOU

Prof. A.B. Bose
Director
School of Continuing
Education, IGNOU

Block Preparation Team

Prof. P.R. Reddy
Vice-Chancellor
Sri Padmavathi Mahila
Vishwa Vidyalayam
Tirupati

Mrs. Mary Mammen
CMS Hospital
Vellore

Dr. Mrs. S.R. Mudambi
MIDC Pimpri, Bhosari, Pune

Dr. Mehtab Bamji
National Institute of
Nutrition
Hyderabad

Mrs. Arvind Wadhwa
Lady Irwin College
New Delhi

Ms. Annu J. Thomas
School of Continuing
Education
IGNOU, New Delhi

Prof. B.N. Koul
Executive Director
STRIDE
New Delhi

Prof. Prabha Chawla
School of Continuing
Education
IGNOU, New Delhi

Ms. Deeksha Kapur
School of Continuing
Education
IGNOU, New Delhi

Project Design

Prof. P.R. Reddy (Editor)
Vice-Chancellor
Sri Padmavathi Mahila
Vishwa Vidyalayam
Tirupati

Ms. Annu J. Thomas
School of Continuing
Education
IGNOU, New Delhi

Course Revision

Prof. Deeksha Kapur
Discipline of Nutritional
Sciences
School of Continuing
Education
IGNOU, New Delhi

Ms. Rajshree
Ms. Kusum Bhatt
Consultant
School of Continuing
Education
IGNOU, New Delhi

Material Production

Shri Arvind Kumar
Assistant Registrar (Publication)
School of Continuing Education

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PROJECT WORK : AN INTRODUCTION

Welcome to Course 4. You have so far studied several theoretical principles and undertaken practical activities as well. Now you should be ready for the excitement of planning and implementing your own project. If you are already a community educator you would have several ideas on the subject. But for those of you who are not but hope to undertake such a professional venture, the project work will take you step-by-step through the process. We are sure you would have developed the skills you need to try your hand at project work.

Before you begin, go through this discussion very carefully. If you have any problems or queries you are welcome to correspond with us. To begin with let us talk about the following points: How project work will help you and what are the procedures to follow.

How Project Work Will Help You?

We envisage that project work will give you much needed field experience. This will sharpen your skills and shape your attitudes. You will be undertaking project work in consultation with a counsellor allotted to you by the Coordinator of your study centre as well as a representative of a voluntary organisation/institution engaged in community work. This interaction with your counsellor and with community workers and educators would be helpful to you and would help to minimize your problems. Such experience would also help you to gain credibility as a nutrition or health educator.

What Procedure to Follow?

The following process chart shows you the necessary procedure.

Contact the project counsellor and field guide allotted to you (your resource persons).

↓

Finalise your, project proposal based on one of the themes I-V or any other of your choice and submit to study centre coordinator after approval by both resource persons.

↓

Send one copy of the approved project proposal to us with the signature of the project counsellor (Use format given in Annexure 1).

↓

Conduct your project work.

↓

Prepare the project report (2 copies).

↓

Fill form given in Annexure 3 and submit one copy of the final project report to the coordinator of your study centre.

↓

Send the second copy of final project report to us at the following address for evaluation with the form given in Annexure 2 completed.

DNHE-4 : PROJECT EVALUATION
BLOCK 12, STUDENT EVALUATION DIVISION (SED)
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
IGNOU COMPLEX , MAIDAN GARHI, NEW DELHI - 110068

The previous discussion has taken you quickly through the steps you have to complete. Read it through a couple of times so that you are clear about how to proceed. If at any stage you feel in need of our comments or suggestions please write to the following address.

DNHE-4 : QUERIES
DISCIPLINE OF NUTRITIONAL SCIENCES
SCHOOL OF CONTINUING EDUCATION
IGNOU COMPLEX, MAID AN GARHI, NEW DELHI-110 068

Now let us come to the topic of how much time you should spend on the project.

How to Manage Project Time?

As you are aware, this project work is worth 8 credits or 240 study hours. We suggest you manage your time according to the following guidelines.

Activity	**Time (Hours)**
Identification of project and finalising project proposal in consultation with project counsellor and field guide	50
Planning and conducting project work in the field with periodic review by project counsellor and field guide	150
Analysing observations/results and writing the project report	40
Total	**240**

SECTION 1 DOING PROJECT WORK

Structure

1.1 Projects: What They Are About

1.2 Preparing the Project Proposal

1.3 Planning and Conducting the Project

1.4 Writing the Project Report

1.5 The Role of the Project Counsellor and the Field Guide

1.1 PROJECTS: WHAT THEY ARE ABOUT

What is a project? It's a small word but can mean different things to different people. We have used the word to mean a type of action oriented research with planning and designing elements as well. The objective is not just to give you a feel of community work but also the ability to analyse and evaluate your own observations. As you begin project work and get involved with the many activities it entails, you will find that project work develops special skills: it encourages you to think, discover solutions to problems and develops interpersonal and communication skills. Taking your own decisions and successfully completing a project gives self confidence and a sense of achievement. For us it is very encouraging to feel that you will be going beyond the course material we have supplied. In a way you will be "locating" your own information, organising and analysing the material and writing down your own observations and the result of your experiments with different approaches, surveys, interviews or case studies.

Remember that people with field experience can be very helpful. So talk to community workers in your locality. They can give you needed advice and practical hints. This is often much more useful than reading several books or journals. Such an interaction would give you an insight into the problems and possible solutions in community work. You should view both the project counsellor and field guide as people who can help you at every stage of your project. We will elaborate on their role in subsection 1.5. You would most probably need their valuable assistance in choosing a suitable topic, collecting information and implementing a project. It is up to you to make the best use of this academic and field level resource.

Now let us move on to a discussion of the steps involved in your project work.

Essentially these are:

1) Preparation of the project proposal and its finalisation

2) Planning and conducting the project

3) Analysing your observations and drawing conclusions

4) Writing the project report.

1.2 PREPARATION OF THE PROJECT PROPOSAL

Quite simply a project proposal is a description of what you hope to achieve and how you intend to go about it. In other words it gives a brief idea of objectives and methodology.

Don't rush over this stage. Taking time to think through the project early enough can save you from much anxiety and overwork later.

While preparing a project proposal you should go through the following steps :

1) Go through the themes I-V given in Section 2. Choose one which you think you can handle. You can also select your own theme.

2) Decide, on the area (city, village or town) you want to work in. You can consult the field guide or project counsellor who may be able to put you in touch with a community or may suggest an institution (such as a school or college) or a clinic, community centre.

3) Visit the locality. Talk to the Nutrition/Health worker in the area in order to identify the major problems in relation to the theme selected.

4) Decide on the target group — whom will you be working with in the community?

5) A. Think of the types of nutrition/health messages you want to convey and the methods and media that could be used.
   B. Alternatively whom would you like to survey through interviews/questionnaires or which individuals would you like to study closely for compiling case studies?

6) Take a decision on approaches and strategies you would use to help you collect information or data (to use the technical term).

7) Now put down your project proposal. Do not write more than 500-600 words using the format provided in Annexure 1. Remember that your project proposal should have the signatures of your project counsellor before you send it to the coordinator of your study centre. Send us a copy of the form NOT the original.

We must emphasize that you should not be overambitious when taking on a project. You must choose a project that you can handle and which will not be too difficult for you. Don't let it bother you if your project is not earth shattering or mind boggling! Also approach your project with an open mind. No one has all the answers and everyone has some problems in the initial stages. Don't hesitate to discuss your ideas and doubts with the project counsellor and field guide.

We earlier mentioned that you have to select one out of the five themes given. You are also free to select your own theme if approved by the project counsellor and field guide. The themes are:

Theme 1 : Assessing Message, Media and Methods

Theme 2 : Designing Participatory Approaches

Theme 3 : Comparing Methods and Media

Theme 4 : Analysing Knowledge, Attitudes and Practices

Theme 5 : Using Case Studies

Here we are providing you a simple guide on how to prepare a proposal. We begin with a review of the typical parts of a project proposal. The parts are summarised as follows:

- Title
- Introduction (including statement of the proposed work, Purpose and Significance of work)

- Methodology/ Description of the proposed plan of work
- List of references

Let us know in detail about these parts and focus on proposal writing. We begin with defining the points you need to consider while writing the title of your study in the proposal.

Title

The title of your project work should be comprehensive enough to indicate the nature of the proposed work. But, it should be concise and brief. We must emphasize that you should not be overambitious when taking on a project. We must choose a project that you can handle and which will be not be too difficult for you.

We earlier mentioned that you have to select one out of the five themes given above. You are also free to select your own theme if approved by the project counselor and the field guide. For example, if you choose Theme 4: Analysing Knowledge, Attitudes and Practices. Within this theme your study title can be: "To assess knowledge, attitude and practices of mothers regarding infant feeding practices".

You will find the detailed discussion on each of these themes in Section 2.

Introduction

The introduction of your proposal should begin with a capsule statement of what is being proposed and then should proceed to introduce the subject/area/topic under study. Thus the introduction should be comprehensible and give enough background to enable any reader/expert to place your particular work in context of common knowledge and should show how its solution will advance the field or be important for some other work. State the importance of your project work also in this part of your proposal.

Remember, a good proposal begins with a clear idea of the goals/objectives of the project. Objectives are what you intend to examine in your field work. For example, on the topic mentioned above, your objectives can be:

i) To assess the infant feeding practices;

ii) To assess the nutrition knowledge and attitudes of the mothers regarding infant feeding, etc.

Methodology

This section is very important because it indicates how you plan to tackle your project work. It will provide your work plan and describe the activities necessary to complete your project.

You need to consider about the sub sections while writing the methodology of your project work:

- *Subjects/ Sample/Locale:* This sub section will decide on various aspects like who will take part in the study (children, women, men etc.), what will be the sample size, what will be the inclusion or exclusion criteria for the selection of the subjects, how will you select the subjects, where will the study be conducted (area) etc. You must discuss all these aspects with your counsellor in order to get a clear picture of the sample to be taken for the study.

- *Instruments:* In this sub section you will highlight the techniques/ instruments/ tools you plan to develop and use for the collection of data related to your project work. For example while studying the infant feeding practices what tool would you use? Would you design a questionnaire covering different aspects of infant feeding on which data will be collected? Similarly for assessing the -knowledge of mothers would you use a questionnaire? Like this write about the tools you would use to collect the data. Also tell about the reason for their selection and reliability of the tool.

- *Procedure:* In this part you will elaborate on the issues like how do you plan to carry out the study, what activities will be involved, what will be the total duration of the study etc.

Note: The method section should comply with the objectives of your study. You need to define the tools and methods for every objective that you desire to achieve with your study. This part may also include the statistical methods/data analysis procedures/ techniques.

Ethical considerations, if any, are also included here in the method section of the proposal.

List of References

It is important that at the end of the proposal you list the references, literature or a bibliography you have reviewed so far in developing your plan for your project work. This section will contain an alphabetical list of all source material to which reference has been made in the proposal.

A sample project proposal is attached at Annexure 5 for your perusal and reference. Read it carefully and plan your project proposal accordingly.

1.3 PLANNING AND CONDUCTING THE PROJECT

Once you have your project proposal ready, the next step is to prepare a detailed plan of what you propose to do. Using a step-by-step approach is a must. Some key questions that would help you with preparation of a plan include:

- How many stages or phases would be necessary?
- Which tools and techniques need to be used?
- What steps would be required to finalise the tools and techniques? Is a pretest going to be conducted?
- Who are the field level functionaries and community leaders who could help you? How will you get in touch with them?
- How many sessions would be required with community members? How much time would these take and how many people would be involved?
- When will community meetings be organised'— in the morning, afternoon or evening? Remember that the convenience of the target group is all important. Deciding on timings with their help would be best to ensure full participation.
- Where will the "action" take place? In the panchayat building, in a school or health centre?
- How about the local politics in the community or institution that might influence your work?

- Where, when and how would the Voluntary organisations/Institutions to which you are attached play a role in your project work?
- What would be the best way to analyse the data you collect and arrive at conclusions? Is a post test necessary? How would this be constructed?
- What assistance would be given by the project counsellor and field guide in project implementation?

These are of course general questions — the list is by no means complete. You may add several more as you think through the theme and topic of your project work. Think of the specific planning needs involved. This is very important.

Now let's come to the steps involved in conducting your project once your project plan is prepared (in line with the approved project proposal).

STEP 1 : CONTACT COMMUNITY MEMBERS AND LEADERS, FIELD LEVELFUNCTIONARIES/WORKERS TO IDENTIFY PROBLEMS/SOLUTIONS RELATED TO A PARTICULAR AREA IN NUTRITION AND HEALTH EDUCATION

STEP 2 : COLLECT DATA RELATED TO THE BACKGROUND OF THE TARGET GROUP SELECTED

STEP 3 : SELECT AND FINALISE THE TOOLS AND TECHNIQUES RELEVANT TO THE THEME AND TARGET GROUP (See theme discussion in 'Section 2)

STEP 4 : CONDUCT PRE TESTS AND POST TESTS WHERE MENTIONED (See theme discussion in Section 2)

STEP 5 : TABULATE DATA COLLECTED OR WRITE FULL DETAILS OF OBSERVATIONS RECORDED

STEP 6 : USE STATISTICAL METHODS TO ANALYSE DATA WHERE APPLICABLE (See Annexure 4 for details)

STEP 7 : LIST CONCLUSIONS/INFERENCES

STEP 8 : WRITE PROJECT REPORT

At each stage the guidance of the project counsellor and field guide would be invaluable for you.

1.4 WRITING THE PROJECT REPORT

When you reach the wonderful stage of having completed your project there will be a sense of satisfaction. The next stage—putting everything down on paper — can be both challenging and exhausting. You would find the following discussion useful in writing your project report well.

Before beginning to write the report, you must first think about how you would like to organise the report. Suggested headings/topics for different sections of the report are summarised in Section 2. Each of the five themes has been dealt with separately. This would help you to concentrate on the one relevant to your work.

It would be of great benefit to first collect the following materials and arrange them in files.

- Approved project proposal

- Description of procedures in selection of sample
- List of tools and techniques used
- Description of use of tools and techniques
- Record of media/aids developed e.g. photocopies of flash cards, flip books, charts, posters etc.
- Original and English translation versions of materials when working in a regional language.
- Observations made during the course of project work (data organised in the form of tables are very useful).
- Analysis and conclusions made on the basis of observations.

You could label the files in an appropriate way so that you can refer to them whenever you need to do so.

Usually the project report begins with a page like this.

TITLE : In Capitals

YOUR NAME : In Capitals

A project report submitted in partial fulfilment of the requirements for the Diploma in Nutrition and Health Education.

School of Continuing Education
Indira Gandhi National Open University
Year _____

After this page comes the list of contents. You could write this out on the same way as we write the structure of any unit/section. Indicate page numbers corresponding to each section/subsection after final typing.

Your next task is to present the major features of your project work in the best manner possible. Remember the 5 C's and ask yourself the following questions in relation to each.

1) CLARITY	:	Am I being as clear as possible? Could I use diagrams, flow charts?
2) CONCISENESS	:	Am I being as brief as possible? Are my sentences and paragraphs too long?
3) COMPREHENSIVENESS	:	Have I covered all the points I wanted to talk about?
4) CORRECTNESS	:	Is every point I make factually correct?
5) CREATIVITY	:	Have I presented the material in as imaginative and creative way as possible?

Sometimes you may have a problem with judging your own work. Here your project counsellor and field guide can help you. You cculd also discuss your initial rough drafts with supervisory staff at the field level who have watched you doing your work.

The basic elements of a project report usually include the following in one form or another:

- INTRODUCTION
- METHODOLOGY
- OBSERVATIONS
- RESULTS AND DISCUSSION
- CONCLUSIONS

There are some variations introduced from one theme to another as you will find on reading Section 2. You can also make changes in consultation with your project counsellor/field guide.

Now let's take a quick look at what we mean when we use the terms given earlier, in the context of a project report.

INTRODUCTION : Description of the existing problem and the target group; Description of what the project aims to achieve and why it is being undertaken from your point of view as well as the community's. The introduction should end with a list of aims and objectives of the specific project.

METHODOLOGY : Description of the way in which the project was conducted including important aspects such as:

— identification of problem area

— identification of target group

— design of tools

— use of techniques

— timing of project work

If any modifications became necessary (in comparison with procedures given in approved project proposal) these must be highlighted and reasons given for the same. Please do not hesitate to give this information. It is good to make changes if they will help to achieve better results.

OBSERVATIONS : Description of what actually happened when the project was conducted. This could be extended to assessment of group activity conducted by you or other members of the group belonging to the community. It could also involve comments given by field level staff or functionaries.

RESULTS AND DISCUSSION : Description of the facts you have learned in relation to the theme you identified and the specific topic within the theme that you selected. If you feel that the results you obtained were influenced

by some special factors these must be discussed in detail. Similarly there would be-some features you might want to explain or highlight This is the place in the project report to do this.

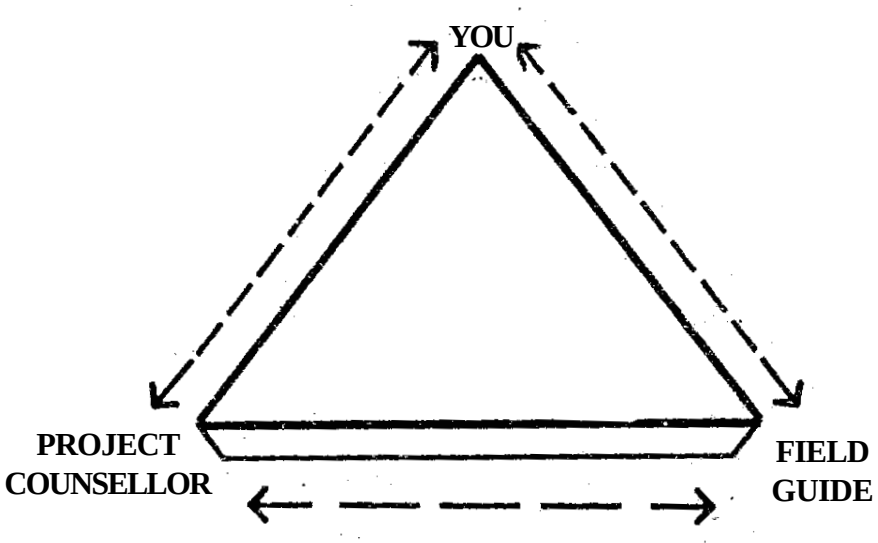
CONCLUSIONS : Description of relevance of your project to planning/ implementation/evaluation of a nutrition and health education programme. Are there any general recommendations emerging from your work?

1.5 ROLE OF THE PROJECT COUNSELLOR AND THE FIELD GUIDE

Let's begin by asking you: What do you expect from the project counsellor and field guide? You can jot down these expectations here.

Realising your expectations would depend upon your own initiative. In strictly academic terms the project counsellor guides you in devising and formulating the project depending on the feasibility. It is the field guide who can tell you how feasible your project is: Can it be done or not? Would the extension unit of the institution or voluntary organisation be able to help or not? Remember to check out all subject related points with the project counsellor and all implementation details with your field guide.

The following figure gives you an idea of how you should interact with both resource persons.



Notice that you must start the process and maintain it. The dotted lines indicate that in some situations the project counsellor or field guide may contact you. However, do not expect this to happen routinely. It is also possible that in some cases the project counsellor would be in close touch with the field guide. Again this is not always going to happen. You may have to work out a way if you need them to meet in order to discuss a particular matter.

You should realise that actually "doing the project" is your task. To get the most out of these experts, you must take the initiative in asking questions, organising your own activities.

If you have any problem with identifying a suitable project counsellor or field guide write to or meet the Coordinator of your study centre.

SECTION 2 THEME AND PROCESS OUTLINES

Structure

2.1 Introducing the Themes and Related Processes

2.2 Theme 1 : Assessing Message, Media and Methods

2.3 Theme 2 : Designing Participatory Approaches

2.4 Theme 3 : Comparing Methods and Media

2.5 Theme 4 : Analysing Knowledge, Attitudes and Practices

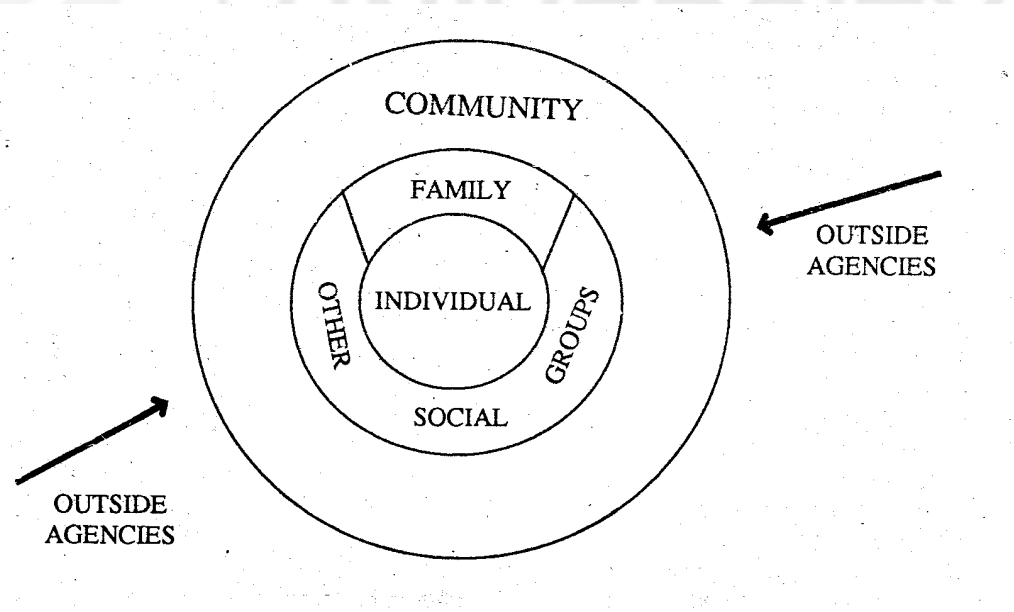
2.6 Theme 5 : Using Case Studies

2.7 An Overview of Themes and Processes

2.1 INTRODUCING THE THEMES AND RELATED PROCESSES

In the last section you went through a general discussion on the procedures involved in your project work. In this section we will discuss five exciting themes you can work on. Our aim is to tell you the major concepts related to each theme and give you an outline of the processes in a step-by-step form. You must remember that the process we have mentioned in relation to each theme may need modification depending on the specific topic you select and the situation in the field. Credit will be given to the originality and creativity you show in dealing with problems and arriving at solutions if possible. So don't be hesitant about discussing this aspect in your project report.

Now coming to some major points that must be emphasized. In your field work you will find yourself working at different levels as shown in the following figure.



Depending on the theme and the specific topic you select related to that theme, you^ may decide to work with individuals, families of a particular type (e.g. low income families), other social groups such as mahila mandals or youth clubs. Focussing on a target group is crucial.

The next step is to identify and analyse a particular problem that is of nutrition/health

significance and which you would like to concentrate on for the purpose of your project work. At this stage community workers, supervisors of field level functionaries, community leaders can give valuable information. But never make up your mind without talking to a few members of the target group. And always remember that you have to win the trust of people before they will tell you the facts.

So, whatever the theme you select, your first two steps would be:

1. Identify the target group

2. Analyse the problem of significance in the community particularly for the target group

This will lead you to discover your aims and objectives as well as decide on important aspects such as

— What to communicate
(The Message)

— How to communicate
(Media and Methods)

— When to communicate
(Timing and Schedule)

— How often to communicate
(Repetition of message)

We are, of course, assuming that we know the answer to the question: Who will communicate? The answer is YOU. So select a topic which you can handle and which you are comfortable with.

Before you actually go through the themes you must first be acquainted with three important terms. These are:

- population
- sample and sampling
- pre-test and post-test

In our context, we will use the term *population* to refer to all members of a particular group of people. A *sample* is a much smaller group of people drawn from the larger population. Every' effort has to be made to ensure that this sample represents the larger population i.e. it has the major characteristics and reflects the composition of the population.

Now how do we select a sample? We may decide to choose individuals randomly so as to avoid any bias or prejudice on our part. This is called *simple random sampling*. Such a method is useful if the members of a large group are quite similar in most respects e.g. age, sex, socio-economic background, educational background. On the other hand, in a large group which is not homogenous we might have to first decide on categorising people in a manner useful for the purpose of our projects (such as on the basis of income) and then select members from each category. This is called *stratified random sampling*.

Of course it must be obvious to you that we would go in for sampling only if the group we want to work with is very large and we cannot contact everybody. Otherwise it

might be possible for us to cover all members of a group with 10-15 members. Coming to the next set of terms — pre- and post-tests. A pre-test means a study of any aspect before we initiate action in the community. Once we decide on the target group and what we want to do, for example, we can conduct a pre-test with a few individuals belonging to the target group. Or if we are trying to see if attitudes have changed after our action/programme we would obviously interview people or administer a test before (pre-test) and after (post-test) the programme. In the second case we are using pre and post tests in order to see if our action/programme has made a difference. There are ways in which we can find out whether it can be due to chance factors. You will find a description of these tools in a statistics book or a book on research methodology. Annexure 4 gives you a simple description of some statistical tools and techniques you might need when you analyse the data you have collected.

Now let us begin our discussion on themes 1 to 5 and the step-by-step process for each.

2.2 THEME 1 : ASSESSING MESSAGE, MEDIA AND METHODS

In Course 3 you have been introduced to various concepts and principles which would help you to:

- develop and formulate the message
- select one medium or a combination of media
- design the particular methodology in order to convey the message through the selected media

As we mentioned earlier you have to identify a target group and the particular problem you would be tackling. The next steps are outlined in the following process chart:

THEME 1 : PROCESS CHART

- Identify a message / messages relevant to the target group and the problem area
- Develop the message into the form in which you would like to communicate it such as
  a lecture
  flash cards/flip books
  posters
  demonstration session
  theatre/role play/simulation
- Select your sample from the target group
- Present your message in the final form to a few individuals from among the larger population of the target group (pretesting the message)
- Make modifications in your presentation based on assessment of the response. Note carefully the points raised by members of the target group – even their expressions, gestures, silence/pauses.
- Finalise message content and presentation
- Deliver the message to the sample and assess the response

An example will help to make things clearer.

Theme : Assessing Message, Media and Methods

Topic : Preventing Dehydration due to Diarrhoea in Infants and Young Children

Target group : Mothers upto 35 years of age belonging to low income families

Message areas identified :

- Diarrhoea management in mild cases.
- Need for hospitalization in severe cases.
- Differentiating between mild, moderate and severe cases.

Messages

- In mild diarrhoea prepare ORS and give to the child frequently.
- Continue to breast feed and offer clear and fresh liquid foods such as soups, dal water, coconut water.
- If the condition does not improve take the child to hospital/nearby medical centre. Continue giving ORS/other liquid upto the time of admission of the child.

Possible responses of target group :

"It's not easy to prepare ORS"

"We don't have the money to buy fuel and then waste it on boiling water."

"How can we feed the child during diarrhoea? And if we give more water, won't the diarrhoea increase?"

"Are you trying to say we don't prepare food for our children in a clean way?"

If you look at responses such as these, each highlights possible flaws in presentation of a message and an attempt has to be made to overcome them. We must also remember that the message may be well formulated but the audience may be unconvinced because of existing prejudices, superstitions, negative attitudes. It is also worth mentioning that a group interaction is quite a personal experience. Is there anything you should do to improve the way you handle a group? Try to learn from people with a lot of experience in the field.

And one final point: anticipate responses and be prepared to handle them constructively in redesigning and reformulating the content of the message or its presentation.

Your project report on this theme should be organised as follows (took up sub-section 1.3 in Section 1 for general details)

1. Introduction
2. Objectives
3. Methodology regarding plan of action, sampling and tools and techniques
4. Observation/collection of data
5. Analysis of data
6. Conclusion

IMPORTANT: Remember to give full details. It is necessary to attach materials you have prepared in order to communicate the message/messages e.g. photocopies of flip charts, of or pamphlets. These will be essential for the evaluator and the review committee. If you submit photographs, those; which highlight your role and your interaction with lift group would be of great use. Obviously you may be the regional language in group interactions. In such you must attach an English translation of the original as well as the original version in the regional language.

2.3 THEME 2 : DESIGNING PARTICIPATORY APPROACHES

What do we mean by the terms "participatory" and "non-participatory"? In a sense it relates to how much we allow the target group we are working with to shape our programme or action. Participatory approaches basically state "we are working with people to accomplish what they want to do. We are only helpers who help to make things happen and provide guidance if necessary". Non-participatory process and approaches take a top-down view and the underlying philosophy is "we know everything—you don't know anything. We will decide on what is to be done, you just follow instructions".

It is gradually being realised that we can rely on the community to find their own answers once we provide a starting point with scientifically correct information and full explanation.

This usually provides a nucleus for animated discussion and argument. While a community member may not know how exactly a particular disease example, he or she may know of some natural remedies for it. Considerable research has already been conducted in India on the use of participatory methods. It would be useful to utilise this in designing and implementing nutrition and health education programmes. However, in such programmes there would be a lot of information we may need to convey and share. This makes it a truly two-way process of exchange and sharing.

Working on this theme should help you to formulate a participatory approach to dealing with a particular problem. In addition to identifying the target group and problem you can go through the following steps.

THEME 2 : PROCESS CHART

- Discuss the problem with members of the target group individually and then as a group (if the group is large, work with a sample).
- Let the group assess the degree of the problem in the community and document cases or affected individuals.
- Help the group if necessary to arrive at a plan of action.
- Suggest ways in which the group can work on their plan in the community and which agencies can help them.
- Assess the adequacy of the individual and the group work sessions and note improvements needed in your own interactions with group members. After going through a self-assessment, invite comments from the target group.

To explain these points, let us use an example. Suppose you have identified vitamin A deficiency as a problem affecting the preschoolers in a particular village. You find that the preschoolers are not attending a preschool or child care centre in the village. As a result there is no common place for meeting the children. You then decide to involve both mothers as well as children first in separate sessions and then together. After describing the symptoms of vitamin A deficiency you may decide to ask the mothers to list the names of children whom they know who appear to have vitamin A deficiency; which locality they live in; their age, sex and social background. The mothers can then be asked to prepare a map of the village showing where the affected children live. This would given you an idea of which families are affected most in relation to their socio-economic background since housing patterns in a village often reflect social position in terms of class and caste.

Next you could work with the group explaining the common reasons for vitamin A deficiency. From this the group could evolve simple strategies. You would of course give them the freedom to decide on a plan of action. Then you may be able to suggest outside agencies who can help. Then you would have to look back at how satisfactory the participatory approach was. Questions like the following would be useful in self assessment:

— Did I manage to convey the necessary information in a natural and convincing manner? If not, why? ,

— Was the group interaction smooth? Who dominated the discussions? Who got left out? Why?

— Was the plan of action developed comprehensive and reflecting the views of most group members? Is it feasible and scientifically on the right lines?

The same questions can be asked to group members as well to get their assessment of the process. Were they satisfied? Do they think they can implement the plan of action they have devised? What kind of support would they expect from you? Is such expectation justified?

For writing the project report the following headings would be useful:

1) Introduction
2) Objectives
3) Methodology of Evolving Participatory Approach and Details of Sampling, Tools and Techniques
4) Observations of Group interaction
5) Self Assessment of the Process
6) Group Assessment of the Process
7) Analysis of Self and Group Assessment Responses
8) Conclusions

IMPORTANT:	Recording various features of the group interaction is very crucial, If possible ask people who are field level functionaries to observe the interaction and write their impressions as well. Your analysis and conclusions should center around your experience with the participatory approach and how effective this process has been in arriving at group decisions. Would you rate the participatory approach as giving better results than if you had decided on a plan of action on your own?

2.4 THEME 3 : COMPARING METHODS AND MEDIA

Course 3 has introduced you to several methods and media used in nutrition/health education. Selecting an appropriate method/media is very important in ensuring a successful project. The selection of methods and media is conditioned by several factors such as:

- availability of equipment and trained personnel
- relevance to message
- suitability for target group
- availability of financial support

It would be useful to First list your requirements and then list the medium or combinations of media you are thinking of using for delivering a particular message to the target group. You then have to make a final choice. In other words you have to compare the methods and media.

As for the previous two themes, first identify your target group and the problem area. Then follow the steps listed in this process chart.

THEME 3 : PROCESS CHART

- Select a simple message related to the problem area of your target group
- From your list of the possible media you can use, select two media/media combinations
- Formulate the same message using the two media/media combinations
- Try out both media with two sample groups A and B — one with A and the Other with B
- Assess the response of the groups A and B
- Analyse the responses and form an opinion on which medium/media combination you would like to use.

There is one crucial point we must remember during sampling,

SAMPLE

Group A	Group B

A should be equivalent to B in number and composition based on age, sex, background.

We have to remember that we are assuming that groups A and B are so similar that any differences we observe in the response of the groups is actually due to media differences and not your presentation style or variations between the groups. So we have to try our best to keep the groups as similar as possible.

Also do not give too much of a gap between your sessions with Group A and Group B. This is because members of Group A might interact with members of Group B and this may change the attitude of the second group with which you work. So you can take morning and afternoon sessions with the two groups.

You also have to take special care that you do not vary the content of the message. That must remain the same whatever the media you use. Do not add or delete any part of your presentation or any material you use. Be careful about the method you use when you work with a particular medium. When you are comparing media you must use each medium correctly. So look up the theory blocks in Course 3 related to using media in a suitable way. For writing the project report the following headings would be useful:

1) Introduction

2) Objectives

3) Methodology

4) Observations of Group Interaction in Groups A and B

5) Self Assessment and Group Assessment of the Process

6) Analysis of Self and Group Assessment Responses

7) Conclusion

IMPORTANT: Your analysis of the interaction with groups A and B should lead you to a final decision on which media would be most suitable. Select only a sample message e.g. eat green leafy vegetables, keep your eyes healthy or keep clean, avoid disease. The more complicated the message you select the more difficult your experiment would come.

You would be more confident of your decision if you invite other trained people to observe your interactions with both groups. Also be careful to listen to suggestions made by members of Groups A and B themselves.

2.5 THEME 4 : ANALYSING KNOWLEDGE, ATTITUDES AND PRACTICES

Finding out about people's knowledge, attitudes and practices is useful both in

- designing a nutrition or health education programme as well as
- evaluating a nutrition or health education programme

The first is a form of pre-test whereas the second is a post-test.

Before we go any further, what exactly do we mean by KAP or knowledge, attitudes and practices? Let's illustrate using statements indicating people who have acquired knowledge/changed attitudes/changed practices.

Knowledge : Cooking causes nutrient loses. However proper cooking and pre-preparation can cut down losses.

Attitude : My cooking practices can be improved by adopting these practices.

Practice : In order to limit cooking losses of nutrients I do .....

To simplify things for you, this theme has been limited to finding out people's knowledge, attitudes and practices in relation to an intervention launched by someone else in the community e.g. a T.V. programme or radio programme on family planning or a nutrition and health camp organised by a voluntary organisation. In other words you can use this as a sort of post-test.

The following process chart would be useful for you in planning your work:

THEME 4 : PROCESS CHART

- Identify an intervention that has already been carried out in your area of work—village/town/city. Choose one which you yourself are familiar with.
- Find out whom the intervention was aimed at and select a sample from that target group (Select only individuals who were exposed to the intervention). Also select a control group (people not exposed to the intervention but similar to those who were exposed in age, sex composition and background)
- Design a questionnaire or interview schedule to help you in gaining information in a systematic manner.
- Use the tool you have designed with the sample group to find out about knowledge, attitudes and practices in relation to the intervention in the community.
- Assess the effectiveness of the intervention and group opinion as well.
- Suggest improvements or modifications if any.

You may have worked with questionnaires and interview schedules. Basically the difference between the two can be summarised thus:

A questionnaire is a list of questions with spaces marked out for answers, if administered to a person. Such a person must of course be literate in order to fill in a questionnaire.

An interview schedule lists the possible questions which the interviewer could ask the person being interviewed.

In actual practice the questionnaire is often used like an interview schedule and is also administered in this way to a non-literate person.

Questionnaires or interview schedules can include open-ended or closed questions

e.g. A) How often do you breast feed your baby in a day?

3 times ☐ 4 times ☐ 6 times ☐ any other (please specify)

B) Comment on the opinions regarding food to be given to an infant at the age of 6 months.

As you would have realised by now (A) is a closed ended question though some scope is given for the respondent to specify an option different from those listed. (B) is open ended. The person can respond in anyway he or she likes.

However analysing open ended questions is much more difficult because people may come up with many different kinds of answers and you are left with the task of categorising the answers and making sense of the data. So you should use open ended questions where you expect wide variation in people's responses which you cannot predict. As indicated in A you can also design closed questions with some scope for the individual adding additional detail. In this way you may be able to get more specific answers. However, there is no golden rule you can follow. Looking at questionnaires and interview schedules prepared by others can give you a better idea. Also remember to let knowledgeable people in the field look through your tools. You can then make modifications if you feel they have made a valid point. It is best if you pretest your tool with a few members of the target group so that you are sure about the wording of the questions.

The important point you must remember is that a questionnaire or interview schedule must proceed from simple and impersonal questions to more complicated personal ones. Never plunge into a topic straightaway. So start with questions related to name, address, educational background, social background. Then begin with questions related to topic. This is particularly important when discussing topics which may be sensitive e.g. family planning.

Your project report on this theme should be organised as follows :

1) Introduction

2) Objectives

3) Methodology

4) Description of Intervention

5) Observation/Collection of Data

6) Analysis of Data

7) Conclusion.

IMPORTANT : Knowledge, attitude and practice (KAP) studies are employed in several spheres. The underlying assumption is that a person when exposed to a given message first gains knowledge about the topic. Then comes the stage of his or her attitudes being shaped by the knowledge gained. Finally attitudes are translated into action — in other words practice. So your questionnaire/interview schedule should be focussed on finding out the level of the person — knowledge/positive attitude/action or practice. Carefully noting the responses and reaction of the target group is important. *It is also crucial to assess whether changes in KAP patterns of the group were caused by the intervention or other factors. This is why a controlgroup is required. Questions have to be skillfully constructed to gather the maximum information.*

2.6 THEME 5 : USING CASE STUDIES

Case studies, as you know, are used to study a case in depth. A "case" may mean an individual, a family or a community. It may also refer to an event depending on what constitutes the simplest unit of study and analysis.

Why and how do we use case studies? This theme encourages you to work on cases related to any topic in nutrition and health education and through your experience find answers to the questions mentioned earlier.

A few examples would make things clearer.

EXAMPLE A) Community X has a very high incidence of fluorosis. Water level of fluoride is excessive. The community now has started using defluoridation procedures at home. In such a case you could explore the chain of events in the community leading them to adopt this procedure.

EXAMPLE B) Family X is poor. The only bread earner is the father earning a pittance as a landless labourer. Two young children in the family are ill because of malnutrition

and infection. The case studies of these children can be outlined in order to focus on the factors related to poverty and its relationship to malnutrition and associated infection. Such a case can help you analyse how poverty is linked to both malnutrition and infection and also how malnutrition and infection may be related to each other. Tackling such cases through nutrition and health education has its significance, but the need to combine it with immediate food supplementation and medication is obvious.

EXAMPLE C) You can study a nutrition or health education programme as a case. What were the successes/failures? Why did this happen? What lessons can be learnt from the experience?

These examples have listed possible use of case studies as well as different contexts in which they can be used. You can think of several other examples as well.

Constructing a good case study requires a lot of effort on your part. It demands considerable personal involvement in studying the case. Building a close interaction with community members/functionaries/individuals is vital in order to get factually correct information. The chances of your own biases and prejudices influencing the way in which you view a case is much more with this technique.

For the purpose of working on this theme, select two case studies of individuals or one case study of an event or chain of events such as a programme. The following process chart would guide you in formulating case studies.

THEME 5 : PROCESS CHART

- Identify one or more cases according to guidelines previously mentioned. The cases must relate to nutrition-and health education and must therefore center around problem areas in the community you are working with.
- Collect data on cases by using detailed observations and/or interviews.
- Construct the case study/case studies.
- Analyse the case study/studies in order to draw conclusions particularly in relation to, planning, organising or implementing nutrition and health education campaigns/ programmes. If there is more than one case study, compare the case studies and again draw conclusions on similarities and differences.

In the process chart we have mentioned that you have to construct a case study. What do we mean by this? Constructing a case study involves writing out first an outline of the main points you have discovered about the case and how you obtained this information. Then you should cover all these points in running prose so that the case "comes alive" somewhat like a story. Richness of detail distinguishes a good case study. Careful attention must also be paid to ensuring that the information is accurate and reflects the views of the people concerned and not your own.

For our purposes, learning from a case is vital. It is not easy to draw inferences from case studies. You would need to read what you have constructed several times and discuss issues with other people particularly local field level functionaries. There is always the danger that you are misinterpreting information or you may not be fully aware of local practices and customs. Even while writing the case study this exercise can be very useful.

Now, how would you organise the project report for this theme? Here is a suggested guideline.

1) Introduction
2) Objectives
3) Methodology
4) Description of Case study/studies
5) Analysis
6) Conclusion

IMPORTANT :	Remember to do only one case study of a programme and two case studies of individuals. It would help you to draw a flow chart in order to look at a chain of events in brief and in order to look at relationships between people, families within the community. Mapping the geographical area in which you are working and the local facilities available (such as a health centre) may be useful in certain cases. You could involve local community members in this task so that it is as accurate as possible. Checking facts and figures with field level functionaries is important throughout the process.

2.7 AN OVERVIEW OF THEMES AND PROCESSES

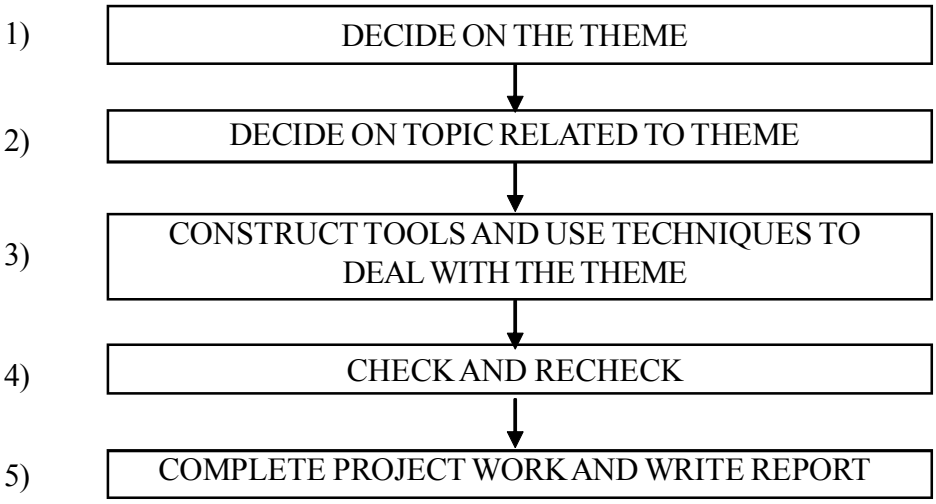
The previous discussion has introduced you to the five major themes we have selected. For each theme we have given a process chart to help you in organising work and to aid in your discussions with both project counsellor and field guide. We had earlier mentioned that you could select your own theme. This is a challenging task and would require extra effort on your part. Be sure to discuss details of the theme beforehand with your project counsellor/field guide.

Topics you could select for any theme would be dependent on the community, you are working with and your own interests and aptitude. Some suggested topics include:

- Prevention of nutritional deficiencies
- Personal hygiene
- Management of diarrhoea
- Infant feeding
- Traditional foods for pregnant and lactating women and their nutritional significance
- Preventing worm infestation and treatment
- Choice of family planning measures
- Relationship between nutrition and infection

The list is given only to give examples of possible topics. The actual choice of topic would be determined by several factors. Remember also to consider the constraints on your time and the financial resources available to you as well. Do not pick a topic which would be too expensive to deal with or which would make too heavy demands on your time.

The following flow chart gives you an overview of themes and processes



Steps 1-3 must correspond with your approved project proposal.

The following list of annexures would serve as a handy guide

ANNEXURE 1 : Form for Approval of Project Proposal

ANNEXURE 2 : Form for Submission of Project Report to the School of Continuing Education

ANNEXURE 3 : Form for Submission to Coordinator of Study Centre with Project Details

ANNEXURE 4 : BASIC STATISTICAL TOOLS

ANNEXURE 1

[To be filled in duplicate. Give the original to your Study Centre Coordinator. Send a copy to IGNOU]

Form for Approval of Project Proposal

SECTION A: BACKGROUND INFORMATION

Name :

Enrollment No. :

Study Centre :

Address :

Name and Designation of Project Counsellor :

Name and Designation of Field Guide :

TITLE OF PROJECT

THEME SELECTED : ☐ ☐ ☐ ☐ ☐

1 2 3 4 5

☐ Any other

NAME OF PLACE WHERE PROJECT IS TO BE CONDUCTED :

STATE WHERE PLACE IS LOCATED

SECTION B: PROJECT PROPOSAL

(Write in clear legible hand; it is preferable to give a typed version. Length should not exceed 500-600 words).

SECTION C : APPROVAL OF PROJECT COUNSELLOR

I certify that I have examined the project proposal submitted by the candidate Mr./Mrs.//Miss _____
and found it to be satisfactory.

_____

Signature of Project Counsellor

Date :

Place :

ANNEXURE 2

[To be filled ia duplicate. Attach the original to the first copy of the project report and send to IGNOU; attach the second to the second copy of your project report and give/ send to your study centre coordinator]

Form for Submission of Final Project Report to School of Continuing Education

SECTION A : BACKGROUND INFORMATION

Name :

Enrollment No. :

Name and Designation of Project Counsellor :

Name and Designation of Field Guide :

TITLE OF PROJECT :

THEME SELECTED :

☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5

☐ Any other (please specify)

NAME OF PLACE WHERE PROJECT WAS CONDUCTED :

STATE WHERE PLACE IS LOCATED :

Date of Approval of Project Proposal :

Date of Submission of Project Proposal (Approved and Duly Signed) to Study Centre Coordinator :

Date of Despatch of Project Proposal (Approved and Signed) to School of Continuing Education, IGNOU :

SECTION B : CERTIFICATE OF PROJECT CONSELLOR AND FIELD GUIDE

We certify that the candidate Mr/Mrs/Miss _____

has planned and conducted the project entitled _____

_____

under our guidance and supervision and that the report submitted herewith was the result of bonafide work done by the candidate in _____ from _____ to
(place) (time period)

_____.

Date : Signature of Project Counsellor

Place:

Signature of Field Guide

SECTION C : COMMENTS OF CANDIDATE ON PROJECT WORK

(In about 100-200 words express your opinion on the project work you undertook emphasizing the most important conclusions you reached and the skills you learnt from the project work)

Date :

Place : Signature of Candidate

ANNEXURE 3

[To be filled and Submitted to the Coordinator of Your Study Centre at the time of Submission of Your Project Report]

Form for Submission to Coordinator of Study Centre with Project Details

1. Name :
2. Enrollment No. :
3. Address :
4. Name and Address of Project Counsellor :
5. Name and Address of Field Guide :
6. Date of Submission of Approved Project Proposal to Study Centre :
7. Date of Despatch/ Submission of Final Project Report to :

   (A) Study Centre

   (B) IGNOU
8. Title of project :
9. Place where Project was Conducted :
10. State in India where Place is Located :
11. Institution and/or Voluntary Organisation Involved (Give name and address) :
12. Comments on Project Work and Supervision by Project Counsellor and Field Guide

Date :

Place: Signature of Candidate

ANNEXURE 4

BASIC STATISTICAL TOOLS

FREQUENCY

Number of times a given event takes place

e.g. number of times a given person in a group speaks. Let's label each person 1, 2, 3 ...we can then construct a frequency table as follows:

Person	No. of times the person speaks in group interaction of ½ hour duration	
1	2	11
2	1	1
3	0	
4	3	111
5	4	1111
6	5	~~1111~~

You would make marks as shown in the figure which correspond to the frequency. In other words you could construct a tally chart as is evident from the figure. Is there any other information you can get from the table? Yes, that's right. You can find out who dominated group discussions — in this case 6 did. How did you find this out? Reading out the maximum frequency of speaking of course.

MODE

Now that we've talked about frequency data we can talk about the mode. The mode of a series of measures is defined as that measure having maximum frequency of occurrence. In the previous case the so-called "measure" was in fact a person in a group. It could also be the number of children who liked a particular dish in an anganwadi. In these cases we are constructing tally charts for the frequency of a qualitative event.

Now let's take the example of a quantitative series of numbers such as the following:

2, 3, 4, 4, 4, 5, 6, 7, 7, 8, 8, 9, 9, 9, 9, 10, 10, 11

You would notice that the number 4 repeats thrice and the number 9 four times. You would also notice that both 4 and 9 have a greater frequency than the numbers immediately next to them i.e. 3 and 5 and 8 and 10 respectively. Such a distribution of numbers is said to have more than one mode i.e. it is bimodal/multimodal.

AVERAGE OR MEAN

- Add up all observations (in numbers)
- Write down the total
- Divide this total by number of observations or number of cases or number of measures

e.g. suppose we have 9 scores on a pretest conducted on a group of rural women

4 3 6 10 5 8 4 3 2

Then the average or mean would be calculated as follows:

4 + 3 + 6 + 10 + 5 + 8 + 4 + 3 + 2 = 45

Now divide 45 by 9. The answer is 5. So the mean is 5.

Now lets put this in formula form.

$$\overline{X} = \frac{\Sigma X}{n}$$

Here $\overline{X}$ = mean

ΣX = sum of all X's i.e. adding up all values of X to arrive at the sum

n = number of cases or measures

Now think of a situation where you are working with a group of 46 women. Using the above method would be difficult, wouldn't it? To make it easier you could first construct a table as follows.

X Score	Frequency (f)
10	2
9	1
8	17
7	8
6	15
5	3
Total	**46**

The mean in this case would be

$$\overline{X} = \frac{\Sigma fX}{\Sigma f}$$

So you could add another column to the above table.

X Score	f	fX
10	2	20
9	1	9
8	17	136
7	8	56
6	15	90
5	3	15
Total	Σf **= 46**	ΣfX **= 326**

We have so far looked at a situation where the class interval width = 1
e.g. 10–9 = 1, 9–8 = 1, 7–6 = 1 and 6–5 = 1

However there may be a situation where each number or score in a series is not represented i.e. does not occur. It would then be convenient to divide a series of scores into ranges

e.g. 10 – 8

7 – 5

4 – 2

1 – 0

You would notice that the class width in this case is 2. Now construct a table as follows.

X Score	f	Midpoint of class interval	f X
10 – 8	2	9	18
7 – 5	4	6	24
4 – 2	7	3	21
1 – 0	2	0.5	1
	15		**64**

$$X = \frac{\Sigma fX}{\Sigma f} = \frac{64}{15}$$

STANDARD DEVIATION

The next question that is of great interest to us is: how much variability exists in the data? The most commonly used measure of "dispersion" is the standard deviation. You could describe the standard deviation as a kind of average of the distances of individual measures from the true mean. The formula is

$$\text{Standard Deviation (s)} = \sqrt{\frac{\Sigma x^2}{n}}$$

Where $x = X - \overline{X}$

n = no. of measures

Do not confuse X and x. Can you think of a reason why we square the members and then find out the square root? The reason is that $(X - \overline{X})$ can be negative. However when we square this difference, the quantity becomes positive and of course square roots of positive numbers are positive.

Let's take a simple example.

2 5 7 7 10 11

This is a set of six scores on a test ($\Sigma X = 42$; Mean or $\overline{X} = 7$) The deviations from die mean and their squares may be expressed as:

–5	–2	0	0	+ 3	+ 4	$\sum = 0$
25	4	0	0	9	1	$\sum = 54$

$$S = \sqrt{\frac{\Sigma x^2}{n}}$$

$$= \sqrt{\frac{54}{6}}$$

$$= \sqrt{9}$$

$$= 3$$

This means the set of scores we worked with has a standard deviation of 3 units of measurement about the mean value of 7.

Now how would we calculate standard deviation in the case of data arranged as ranges i.e. grouped data? Look at the following table.

Weight (kg)	**Midpoint of Class X**	**$u = \frac{X - A}{C}$**	**Frequency**	**fu**	**fu^2**
60-62	61	–2	5	–10	20
63-65	64	–1.	18	–18	18
66-68	A →67	0	42	0	0
69-71	70	1	27	27	27
72-74	73	2	8	16	32
			$\sum f=100$	$\sum fu = 15$	$\sum fu^2 = 97$

$$S=C\sqrt{\frac{\sum fu^2}{\sum f}-\left(\frac{\sum fu}{\sum f}\right)^2} = 3\sqrt{\frac{97}{100}-\left(\frac{15}{100}\right)^2}$$

$$= \sqrt{0.9475} = 2.92 \text{ kg}$$

Here S = Standard deviation

C = Class interval

$\sum$ = Sum

A = Average or Mean that we assume e.g. in this case we have assumed that the mean is 67.

Have you been able to appreciate the importance of calculating the standard deviation? Consider the following examples of 8 numbers each:

(A) Arithmetic mean $= \overline{X} = \dfrac{\Sigma X}{N}$

$$= \frac{12+6+7+3+15+10+18+5}{8}$$

$$= \frac{76}{8} = 9.5$$

$$S = \sqrt{\frac{\Sigma\left(X-\overline{X}\right)^2}{N}} = \sqrt{\frac{\begin{matrix}(12-9.5)^2+(6-9.5)^2+(7-9.5)^2+(3-9.5)^2\\+(15-9.5)^2+(10-9.5)^2+\\(18-9.5)^2+(5-9.5)^2\end{matrix}}{8}}$$

$$= \sqrt{23.75} = 4.87$$

(B) Mean $= \overline{X} = \dfrac{9+3+8+8+9+8+9+18}{8}$

$$= \frac{72}{8} = 9$$

$$S = \sqrt{\frac{\Sigma\left(X-\overline{X}\right)^2}{N}}$$

$$= \sqrt{\frac{\begin{matrix}(9-9)^2+(3-9)^2+(8-9)^2+(8-9)^2+(9-9)^2+(8-9)^2+\\(9-9)^2+(18-9)^2\end{matrix}}{8}}$$

$$= \sqrt{15} = 3.87$$

Compare the standard deviations obtained in (A) and (B) examples. In the case of B each individual number is closer to the mean than in the case of A. In other words the variation from the mean is low when standard deviation is low.

POPULATIONS AND SAMPLES

A population includes all the individual persons, objects, events or other items that exist. The term "universe" is also used for a population.

For various reasons — limitations of time, available funds and the like—research workers rarely study total populations but rather samples drawn from these populations. Often the study of a whole population is impractical—even impossible. For example, can you study all the rural women in a State? You may not have the time or resources to do it. So you may select a group of women from a particular village. Now on the basis of your study of this group what conclusions can you draw about the rural women in that

particular State? The answer would, of course, depend on how closely the sample you have drawn from the population represents the population as a whole.

Now how do we try to ensure that a sample is representative ? It is not usually possible to make sure that a sample is *identical* in its characteristics with its parent population but it is often possible to draw samples which are matched to the population on some relevant variables. These are known as *stratified* samples. For example, if we knew that the population consists of equal numbers of men and women then we could stratify our sample according to sex in the same proportions.

This process of stratification may be thought of as using the known characteristics of the population as the basis of drawing a relevant sample.

The term "stratification" or "stratified sampling" is used because the relevant population information usually concerns proportions of cases in different levels or strata of a variable such as age, class, education or income.

Whether a sample is stratified or not, we have the basic problem of selecting a representative sample. There are two basic principles involved in techniques of sampling which are acceptable. These are:

a) avoid all sources of bias in sampling

b) select sufficient cases so that chance variations do not make the sampling unrepresentative.

We can use simple random sampling by selecting people, objects or events according to tables of random numbers. Each possible instance in the population is assigned a number and is used in the sample if its number arises as we move on through the table of random numbers. Simple random sampling gives each instance an equal probability of selection and it also gives all combinations of instances an equal chance.

The next technique we will discuss is called proportionate stratified sampling. If we stratify our sample to have equal numbered sex groups we are removing the chance of any random sample combinations that would lead to a sample composed of for example, all men.

Systematic sampling can be used if we have a list. We can then pick up "every tenth person on the list". Of course, this method would be useless unless the list itself is representative of the population or is an enumeration of the entire population.

STATISTICAL DECISIONS

As you would have gathered from our previous discussion, we study samples from a population in order to make decisions about the population itself. Such decisions are called statistical decisions. For example, we may wish to decide on the basis of sample data whether a new serum is really effective in curing a disease, whether one educational procedure is better than another and so on.

STATISTICAL HYPOTHESES

In attempting to reach decisions, it is useful to make assumptions or guesses about the populations involved. Such assumptions, which may or may not be true are called statistical hypotheses. A null hypothesis is formulated for the sole purpose of rejecting or nullifying it e.g. if we want to decide whether one procedure is better than another, we formulate the hypothesis that there is no difference between the procedures (i.e., any observed differences are merely due to fluctuations in sampling from the same population). Such hypotheses are often called null hypotheses.

TESTS OF HYPOTHESES AND SIGNIFICANCE

If we suppose that a particular hypothesis is true we find that the results observed in a random sample differ markedly from those expected under the hypothesis on the basis of pure chance. Using sampling theory, we would say that the observed differences are *significant* and we would be inclined to reject the hypothesis (or at least not accept it) on the basis of evidence obtained.

Procedures which enable us to decide whether to accept or reject hypotheses or to determine whether observed samples differ significantly from expected results are called tests of hypotheses or tests of significance.

TESTS OF SIGNIFICANCE INVOLVING SAMPLE DIFFERENCES

$$Z = \frac{\overline{X}_1 - \overline{X}_2}{\sigma_{\overline{x}_1 - \overline{x}_2}}$$

Where $\overline{X}_1$, $\overline{X}_2$ are sample means of large samples

σ_1, σ_2 are sample standard deviations

$$\sigma_{\overline{x}_1 - \overline{x}_2} = \sqrt{\left(\sigma_1^{\,2}/N_1\right) + \left(\sigma_2^{\,2}/N_2\right)}$$

This formula can help us decide on the null hypothesis versus alternative hypothesis (i.e. significance of an observed difference) at an appropriate level of significance.

Now what is level of significance? The level of significance tells us the confidence we can have in rejecting a hypothesis. This is read off from tables. A level of significance of 0.05 or 0.01 is commonly used. What does this mean? If, for example, a 0.05 or 5% level of significance is chosen in designing a test of hypothesis, then there are about 5 chances in 100 that we would reject the hypothesis when it should be accepted i.e. we are about 95% confident that we have made the right decision.

For Z scores the range of accepting a hypothesis is –1.96 to + 1.96 and for rejecting the hypothesis the score should be outside this range. In the latter case we would conclude that such an event could happen with a probability of only 0.05 if the given hypotheses were true. We would then say that this Z score differed significantly from what would be accepted under the hypothesis and would be inclined to reject the hypothesis. We can then say that the hypothesis is rejected at a 0.05 level of significance or that the Z score of the given sample is significant at a 0.05 level of significance.

SMALL SAMPLES AND THE "t" TEST

If sample size is less than 30 we use the the t test

$$t = \frac{\overline{X} - \mu}{S}\sqrt{N-1} = \frac{\overline{X} - \mu}{S/\sqrt{N}}$$

Sample size = N Population mean = μ

Sample mean = X

Sample standard deviation = S

$$\hat{S} = \sqrt{N/(N-1)s}$$

The 't test' for independent sets of scores

Suppose you are working with two groups — the members of both groups being chosen at random and you give both groups a test and note the scores. In such a situation the scores of Group A and Group B are not in any way related to each other. So the two sets of scores are *independent* of each other.

In this case you would first have to calculate a figure from your results. This figure is called 't'. Then you would have to look up the figure from published tables in a statistics book to find the probability of getting such a figure purely by chance.

The formula for t is this:

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\Sigma(x_1-\bar{x}_1)^2 + \Sigma(x_2-\bar{x}_2)^2}{n_1+n_2-2}}\sqrt{\frac{n_1+n_2}{n_1 n_2}}}$$

It looks quite complicated does'nt it? As a matter of fact, if you go step-by-step it's not so difficult. The steps are as follows:

1) Calculate the mean of Group 1. This is $\bar{x}_1$
2) Subtract each score in Group 1 from the means and square what you get. Each of these is $(x_1-\bar{x}_1)^2$.
3) Add them up. This is $\Sigma(x_1-\bar{x}_1)^2$. It is the sum of the squared deviations for Group 1.
4) Do the same for Group 2. Thus is $\Sigma(x_2-\bar{x}_2)^2$.
5) Add together the sums of squared deviations for Groups 1 and 2. This is $\Sigma(x_1-\bar{x}_1)^2 + \Sigma(x_2-\bar{x}_2)^2$.
6) Add together the number of cases in Group 1 (n_1) and the number in Group 2 (n_2) and then subtract 2. This is $n_1 + n_2 - 2$.
7) Divide the result of Step 5 by the result of Step 6 and take the square root. This is $\frac{\Sigma(x_1-\bar{x}_1)^2 + \Sigma(x_2-\bar{x}_2)^2}{n_1+n_2-2}$
8) Add $n_1 + n_2$.
9) Multiply n_1 by n_2.
10) Divide the result of Step 8 by the result of Step 9 and take the square root. This is $\sqrt{\frac{n_1+n_2}{n_1 n_2}}$.
11) Multiply the result of Step 7 by the result of Step 10.
12) Subtract the mean of Group 2 from the mean of Group 1. This is $\bar{x}_1 - \bar{x}_2$
13) Divide the result of Step 12 by the result of Step 11, and that's the value of t.

Let's try out these steps using an example.

Scores of Group 1			Scores of Group 2		
(x_1)	$(x_1-\bar{x}_1)$	$(x_1-\bar{x}_1)^2$	(x_2)	$(x_2-\bar{x}_2)$	$(x_2-\bar{x}_1)^2$
2	–3	9	3	–4	16
3	–2	4	5	–2	4
4	–1	1	6	–1	1
5	0	0	7	0	0
5	0	0	7	0	0
7	2	4	8	1	1
9	4	16	8	1	1
Total = 35		34	9	2	4
			10	3	9
			Total = 63		36

$\bar{x}_1 = 35 \div 7 = 5$

$\bar{x}_2 = 63 \div 9 = 7$

$$t = \frac{5-7}{\sqrt{\frac{34+36}{7+9-2}}\sqrt{\frac{7+9}{7\times 9}}}$$

$$= \frac{-2}{\sqrt{\frac{70}{14}}\sqrt{\frac{16}{63}}} = \frac{-2}{\sqrt{5}\sqrt{0.254}}$$

$$= \frac{-2}{2.236\times 0.504} = \frac{-2}{1.127}$$

$= 1.775$

For finding out whether this t value is significant or not you would have to look up the t tables in a statistics book. To do this you need to know the degrees of freedom. This is (the total number of persons — 2) or $(n_1 + n_2 - 2)$. In the example we have just studied $n_1 + n_2 - 2 = 7 + 9 - 2 = 14$.

The larger the value of t, the more the chance that the differences between Group 1 and Group 2 are not due to chance but due to the factor being studied.

The minus sign of the t value in this case can be ignored. Just consider the absolute value i.e. 1.775.

The "t Test" for dependent sets of scores

Suppose you did a pre-test on a group of slum children. Then you conducted an education programme for them and then you give them the same test again as a post-test. You could calculate the t value as follows:

$$t = \frac{\bar{d}}{\frac{S_d}{\sqrt{n-1}}}$$

Where

d = difference between two scores

$\bar{d}$ = mean of these differences

Sd = Standard deviation of the difference

n = number of pairs

Let's try to understand this better using an example

Scores of Group 1	Pro-test Scores	Difference Called		
(x_1)	(x_2)	$(x_2 - x_1)$	$\left(d-\bar{d}\right)$	$\left(d-\bar{d}\right)^2$
2	4	2	0.4	0.16
4	4	0	–1.6	2.56
5	6	1	0.6	0.36
5	4	–1	–2.6	6.76
7	8	1	–0.6	0.36
9	11	2	0.4	0.16
9	13	4	2.4	5.76
10	11	1	–0.6	0.36
10	10	0	–1.6	2.56
10	12	2	0.4	0.16
11	13	2	0.4	0.16
12	15	3	1.4	1.96
14	18	4	2.4	5.76
15	19	4	2.4	5.76
17	16	–1	–2.6	6.76
		Total = 24		**Total = 39.6**

$$\bar{d} = \frac{24}{15} = 1.6 \qquad S_d = \sqrt{\frac{39.6}{15}} = \sqrt{2.64}$$

$$= 1.625$$

$$t = \frac{1.6}{\frac{1.625}{\sqrt{15-1}}} = \frac{1.6}{\left(\frac{1.625}{\sqrt{14}}\right)}$$

$$= \frac{1.6}{\left(\frac{1.625}{3.742}\right)} = \frac{1.6}{0.434} = 3.685$$

The degrees of freedom in this case are the number of pairs minus 1 or 15–1 = 14.

THE χ^2 (CHI-SQUARED) TEST.

As in the case of the t test you have to calculate a value called χ^2 and then you use this figure to find out whether the results you have obtained are due to chance.

Let's take an example. Two groups, A and B, consist of 100 people each who have a certain disease. A serum is given to Group A but none to Group B (which is called the control group). Otherwise the two groups are treated identically. It is found that in Group A and B, 75 and 65 people, respectively recover from the disease. These are the observed results which can be summarised as follows:

	Recover	**Do not recover**	**Total**
Group A (using serum)	75	25	100
Group B (not using serum)	65	35	100
Total	**140**	**60**	**200**

Now suppose the serum had no effect what would be the results we could expect ? Look at the following table:

	Recover	**Do not recover**	**Total**
Group A (using serum)	70	30	100
Group B (not using serum)	70	30	100
Total	**140**	**60**	**200**

To calculate these value to the following steps.

$$\text{Group A (recover)} = \text{Total who recover} \times \frac{\text{Total in Group A}}{\text{Total Number in Groups A and B}}$$

$$= 140 \times \frac{100}{200} = 70$$

$$\text{Group A (do not recover)} = \text{Total who do not recover} \times \frac{\text{Total in Group A}}{\text{Total number in Groups A and B}}$$

$$= 60 \times \frac{100}{200} = 30$$

$$\text{Group B (recover)} = \text{Total who recover} \times \frac{\text{Total in Group B}}{\text{Total in Groups A and B}}$$

$$= 140 \times \frac{100}{200} = 70$$

$$\text{Group B (do not recover)} = \text{Total who do not recover} \times \frac{\text{Total in Group B}}{\text{Total in Groups A and B}}$$

$$= 60 \times \frac{100}{200} = 30$$

Now how do we calculate χ^2 ? Here are the tables once again:

OBSERVED RESULTS

	Recover	**Do not recover**	**Total**
Group A (using serum)	75	25	100
Group B(not using serum)	65	35	100
Total	**140**	**60**	**200**

EXPECTED RESULTS

	Recover	**Do not recover**	**Total**
Group A (using serum)	70	30	100
Group B(not using serum)	70	30	100
Total	**140**	**60**	**200**

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

where O = observed result

E = expected result

$$\text{so } \chi^2 = \frac{(75-70)^2}{70} + \frac{(65-70)^2}{70} + \frac{(25-30)^2}{30} + \frac{(35-30)^2}{30}$$

For finding the degrees of freedom this is the formula:

(number of rows – 1) (number of columns – 1)

The table we have looked at is a 2 × 2 table (see position marked with dark lines).So the degree of freedom is 1. A 2 × 3 table may look like these results of a survey of TV viewing.

	Educational level		
	No Schooling %	Reached class 1-3 %	Reached class 4 or over %
Viewed at least once in previous week	14	22	32
Did not view at all in previous week	86	78	68
Total	**100**	**100**	**100**

What would be the degree of freedom in this case?

$(2 - 1) \times (3 - 1) = 1 \times 2 = 2$

And what would χ^2 be? Look at the following table.

O	E	O – E	$(O - E)^2$	$\frac{(O - E)^2}{E}$
15	22.4	–7.4	54.76	2.445
17	15.5	1.5	2.25	0.145
16	10.1	5.9	34.81	3.447
95	87.6	7.4	54.76	0.625
59	60.5	–1.5	2.25	0.037
34	39.9	–5.9	34.81	0.872
				$\chi^2 = 7.571$

In this appendix you have been introduced to various types of statistical tests you may find useful. Please refer to statistical tables in any standard statistics book. We have not reproduced them here.

ANNEXURE 5

Sample Project Proposal

TITLE OF THE STUDY: TO ASSESS THE KNOWLEDGE, ATTITUDES AND PRACTICES OF MOTHERS REGARDING INFANT FEEDING PRACTICES

Introduction

Child is the chief victim of interplay of nutrition, socioeconomic and health factors that cause malnutrition. The rise of malnutrition in children during the first two years of life is indicative of poor infant feeding practices. Infant and young children has been engaging the attention of scientists and planners since long for the very simple reason that growth rate in the life of human beings is maximum during the early years of life and infant feeding practices comprising of both the breastfeeding as well as complementary feeding have a major role in determining the nutritional status of child. Poor feeding practices in infancy and early childhood results in malnutrition, contribute to impaired cognitive and social development, poor school performance and reduced productivity in later life.

Adequate nutrition is essential for children's health and development. Exclusive breastfeeding is very important in first six months of life. Breast milk provides immunologic protection against death from infectious diseases, such as diarrhoea, respiratory infections, pneumonia and meningitis. Proper and timely initiation of complementary feeding along with breastfeeding helps the child to meet the higher nutritional demands after six months. Good nutrition during this period of rapid growth is vital to ensure that the infant develops both physically and mentally to the fullest potential. Poor feeding practices are a major threat to social and economic development. Nutritional counselling is required to improve the infant feeding practices.

Keeping all this in mind the study is proposed to be conducted to assess mother's knowledge regarding infant feeding and to assess the attitude and practices towards the recommended feeding practices.

Significance of the study:

In India lot of the customs and practices have their effect over health including infant feeding practices. By assessing the knowledge, attitude and practices of mothers regarding their child's feeding, an overview can be obtained about the areas which need modifications and hence specific intervention strategies can be made to correct the same.

Objectives of the study:

The proposed objectives of this study are as follows:

i) To assess the infant feeding practices;

ii) To assess the nutrition knowledge and attitudes of the mothers regarding infant feeding.

Methodology:

Study area: The study will be conducted at Neb Sarai, New Delhi.

Study subjects: The study will be conducted on mothers of children between 0-2 years of age, attending Aanganwadi center at Neb Sarai. An orally expressed consent will be taken by the participating mothers.

Sample size: A total of 25 mothers will be interviewed who will be randomly selected.

Tools and techniques:

I. Infant Feeding Practices (IFP):

IFP will be assessed by a structured questionnaire designed based on the feeding practices related to:

- Early and exclusive breastfeeding
- Value of colostrum and time when introduced
- Frequency of feeding
- Initiation of complementary feeding
- Type of complementary food given (Traditional food/commercial food/Instant infant foods/Modified family meals)
- Feeding during and after illness
- Cleanliness and hygiene issues related to breastfeeding and complementary feeding
- Misconceptions about infant feeding

Subject responses shall be obtained through a questionnaire designed for the aspects mentioned above. Sample questionnaire is attached after the end of the proposal.

II. Knowledge and attitude:

Knowledge and attitude of mothers will also be assessed by designing a questionnaire. Questionnaire will include questions covering different aspects related to infant feeding practices, such as:

- Duration and frequency of exclusive breastfeeding
- Importance of colostrum and time to start colostrum
- Time to start complementary feeding
- Type of complementary food given to child (consistency/nutrient density/traditional and modified family foods)
- Immunisation of child against various diseases (Awareness about importance of immunization, knowledge and follow up of immunisation schedule)
- Hygiene and cleanliness during breastfeeding and complementary feeding
- Dietary practices of lactating mothers
- Misconceptions about infant feeding
- Artificial feeding other than breastfeed
- Utilisation of available nutrition and health services

The questions in the knowledge questionnaire will be close ended i.e. in multiple choice format. Attitude will be assessed using a Likert scale with responses ranging from strongly agree to strongly disagree on a five point scale. Scoring shall be in a range of *+2* to –2. Illiterate mothers will be asked to answer the questions orally and the questionnaire will be filled based on their given answers. Appropriate statistical tools (calculation of mean, percentage etc.) will be used for the analysis of the collected data.

References:

i) National Guidelines on Infant and Young Child Feeding. Ministry of Women and Child Development (Food and Nutrition Board) Government of India 2006. Available at: http://wcd.nic.in/nationalguidelines.pdf

ii) Anand, R.K.; Kumta, N.B.; Kushwaha, K.P. & Gupta. A. The Science of Infant Feeding. Jaypee Brothers Medical Publishers. New Delhi. First Edition 2002.

iii) Kapil U. and Verma D.; Breast-feeding practices in scheduled caste community in Haryana State; (1994) Indian Pediatric, 31, p. 1227-1232.

Questionnaire related to knowledge, attitude and practices regarding infant feeding

Infant feeding practices Questionnaire:

1. How old was the infant when you started breast feeding?
   a) Within few hours of delivery
   b) After two days
   c) After three days
   d) After five days
2. How did you feed the baby the first few days after birth?
   a) Nothing was given
   b) Colostrums
   c) Cow/buffalo/goat milk
   d) Sweetened water syrup
   e) Any other (specify)
3. How long did you /do you intend to breast feed your child?
   a) 0-3 months
   b) 4-6 months
   c) 7-9 months
   d) 13-18 months
   e) More than 2 years
4. At what age did you introduce complementary foods?
   a) 3-4 months
   b) At 6 months
   c) 7-9 months
   d) 10-12 months
   e) After 1 year
5. What was the first food given?
   a) Pureed fruits
   b) Pureed vegetables
   c) Porridge
   d) Cereal pulse preparation
   e) Any other (specify)

Prepare similar questions for other items included in your proposal under infant feeding practices. This is only a sample to show you how to design questionnaire.

Knowledge Questionnaire:

1. For the first 6 months of life, infant should be given:
   a) Only breast milk
   b) Breast milk plus other milk
   c) Breast milk plus ghutti
   d) No breast milk
   e) Don't know
2. To ensure good health, what is the right age to introduce complementary foods in the diet of infants suggest?
   a) 3-4 months
   b) At 6 months
   c) 8-10 months
   d) After 1 year
   e) Don't know
3. To ensure good health, how many times during the day, child should be fed?
   a) 4-5 times
   b) Once
   c) 2-3 times
   d) No food to be given
   e) Don't know

Prepare similar questions for other items included in your proposal under knowledge section. This is only a sample to show you how to design questionnaire.

Attitude Questionnaire:

1. Exclusive breastfeeding for 6 months after birth is:

-2	-1	0	+1	+2
Very Desirable	Undesirable		Desirable	Very Desirable

2. Starting complementary feeding after 6 months of age is:

-2	-1	0	+1	+2
Very Desirable	Undesirable		Desirable	Very Desirable

3. For me improving my child feeding practices would mean to give variety of foods to my children.

-2	-1	0	+1	+2
Strongly Disagree	Disagree		Agree	Strongly Agree

Prepare similar questions for other items included in your proposal under attitude section. This is only a sample to show you how to design questionnaire.