CHAPTER IV

METHOD OF INVESTIGATION
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This chapter deals with the various tools already available for measuring knowledge and need on the basis of which curriculum is designed, selection of appropriate tools for measuring knowledge and need, the procedure employed in the construction of the tools, the methods adopted in selection of samples, collection of data, mode of scoring and the statistical techniques employed in the study.

The present study is concerned with curriculum designing in health education for rural adults. Curriculum is developed on the basis of the knowledge of the target population, needs and interests of the target population, judgment of the experts who are knowledgeable about the needs of the target group. In the present study curriculum is developed on the basis of knowledge and felt needs of the adults and the needs perceived by the experts (doctors, health workers and adult education instructors). The tools already developed and used by earlier researchers to measure health knowledge and health needs are briefly indicated for proper understanding of the tools and selection of tools appropriate in the present context.
4.1 **Selection of tools for measuring health knowledge and needs:**


Rana (1971), Hemalathadevi (1979) and Lokanadha Reddy (1988) used interview schedules for knowledge testing.


For assessing the learning needs, Dexit (1975), Nagappa (1966), North Eastern Hill University (1977) used both questionnaire and interview schedules.
Rohwer (1983), Mitchell (1982), Jones (1978) used only questionnaire.


In the present study, questionnaire is used to assess health knowledge and numerical rating scale is used to measure health needs because of their advantages.

4.2 Description of the tools selected:

4.2.1 Questionnaire:

According to Goode and Hatt (1952) the word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself.

Barr, Davis and Johnson (1953) define questionnaire as "a systematic compilation of questions that are submitted to a sampling of population from which information is desired."

4.2.1.1 Characteristics of a Good Questionnaire:

i. A good questionnaire deals with a significant topic and it is so considered by the respondent. The questionnaire itself or forwarding letter must indicate its importance.
ii. It seeks information which is not obtainable from other sources (like school reports or census data, etc.)

iii. It is as short as possible, though comprehensive and clear enough for securing all the essential information.

iv. It is attractive in appearance, neatly arranged and clearly duplicated or printed.

v. It contains directions which are clear and complete. Important items are defined and each question deals with a single idea in unambiguous terms, so that it is valid and reliable.

vi. It contains questions of an objective nature without any leading suggestions as to the responses desired.

vii. Items are arranged in categories to ensure easy and accurate responses.

viii. It presents questions in a good order, proceeding from general to the more specific responses, from simple to complex.

ix. It is easy to tabulate and interpret, based on a preconstructed tabulation sheet and a visualised final analysis of data.

x. It avoids annoying or embarrassing questions.
4.2.1.2 Merits of Questionnaire:

i. It is less expensive and less time consuming than interview or observation.

ii. Its construction needs less technical skills as compared with those required in conducting interviews and observations.

iii. Questionnaires do not permit variations in questions and as such they help in focussing the attention of the respondents on all the significant items, the interviewing situation, on the other hand is rarely uniform.

iv. In an interview responses are recorded by the investigator, whereas in the questionnaire, the responses are given in the language of the subjects.

4.2.2 Rating scale:

According to Ban, Davis and Johnson (1953),

Rating is a term applied to expression of opinion or judgement regarding some situation, object or character. Opinions are usually expressed on a scale of values. Rating techniques are devices by which such judgements may be quantified.

The rating scale is very useful device in assessing quality - specially when quality is difficult to
measure objectively. Rating scales record judgements or opinions and indicate the degree or amount.

4.2.2.1 Hints on the construction and use of Rating Scales:

i. Rating scales include three factors:
   a. the subjects or the phenomena to be rated
   b. the continuum along which they will be rated, and
   c. the judges who will do the rating.

All these three factors must be carefully selected.

ii. The subjects or phenomena to be rated are usually a limited number of aspects of a thing, or of traits of a person. Only the most significant aspects for the purpose of the study should be chosen.

iii. The different degrees of quality are usually adjectives or descriptions. Their meaning should be clearly different from each other, and in going 'up', the scale, one should feel that the next description represents better quality than the last.
iv. Items may be arranged in ascending or descending order from left to right.

v. At least three divisions of quality must be kept.

vi. The rating scale is always composed of two parts -
   a) an instruction which names the subject and defines the continuum, and
   b) a scale which defines the points to be used in rating.

vii. Any one can serve as a rater, where non-technical opinions, likes and dislikes and matters of easy observation are to be rated.

viii. Pooled judgements increase the reliability of any rating scale. Several judges may be employed, depending upon the rating situation, to obtain desirable reliability.

4.2.2.2 Difficulties in constructing and using Rating Scale:

i. It is difficult to convey to the raters just what quality one wishes him to evaluate.

ii. It is difficult for raters to get rid of the halo effect which causes a rater to carry qualitative judgement from one aspect to another.

iii. Raters tend to be generally generous. It has been verified that 60 per cent to 80 per cent of an unselected group tend to receive above -
average ratings in all traits.

iv. Although pooled judgements of many raters reduce subjectivity of individual judgements, yet the averages of scores thus arrived at are by no means either totally objective or highly valid.

6.2.2.3 Advantages of Rating Scale:

i. Rating requires much less time than ranking methods.

ii. The procedure becomes interesting when graphic method is employed.

iii. They can be used with persons having minimum of training for making ratings.

iv. The range of their application is very wide. They can be used for teaching ratings, personality ratings, testing validity or paper pencil inventories, school appraisal etc.

6.2.2.4 Selection of the type of Rating Scale:

Out of all the six types of Rating scales namely, Numerical scale, Graphic scale, Descriptive scale, Cumulative points scale, Standard scale and Pooled judgement scale, the numerical rating scale was selected for the present study.

Numerical rating scale is a device for making and recording a subjective judgement as to the position of an
individual or item in relation to a pre-arranged scale of values, typically consists of a trait or characteristic. The rater is instructed to assign for each trait or characteristic a number from 0-2 and including the maximum value given representing the degree to which the individual or item is judged to possess the trait in question.

4.3 Construction of Tools to Measure Health Knowledge and Needs:

4.3.1 Construction of questionnaire to measure Health Knowledge:

4.3.1.1 Selection of Areas:

Keeping in view the characteristics and precautions to be taken while constructing a questionnaire, the health knowledge questionnaire has developed.

As health comprises of many areas, it became necessary for the investigator to identify the areas and the items therein which could be included in the questionnaire.

On the basis of the suggestions of the experts, areas of health covered in the previous researches, relevancy and suitability of the areas for rural adults of Chittoor district, some areas originally thought of mere
dropped from the study and those areas include: human biology, mental health, prevention of accidents, use of health services, alcoholism, drug abuse, sex education, death education, consumer health, occupational health, exercise/relaxation/sleep, narcotics, school health programmes, community health, cigarette smoking and contemporary health problems.

The seven areas retained in the study are communicable diseases, non-communicable diseases, first-aid, nutrition, family planning, mother and child care, and personal hygiene.

4.3.1.2 Selection of test items:

In constructing the questionnaire, the investigator had to prepare test items in the Telugu language as it was planned to administer the test to the adults in rural areas. To develop the test items, the investigator made a thorough review of the related literature, consulted experts and the test items that had been used in various testing situations in India and elsewhere. Thus, a draft pool of items for the test was developed. These items were developed in such a way that they were not only more in number than required for the final test but also they were clear, concise and free from ambiguity.
These draft items were given to some doctors and to health education lectures with a request to point out any ambiguity, repetition and inaccuracy in them. At this stage, there were 150 items in the test. Based on their suggestions, all these test items were edited, revised or deleted. As a result, 140 items were retained. Some of the items were provided with two alternate responses (Yes/No), some with fill in the blanks, and majority of them were supplied with four alternatives (Multiple choice).

4.3.2 Preparation of Rating Scales to measure Health Needs:

All the 140 items from the seven areas in the questionnaire were included in the rating scale. This tool was used to identify the felt needs of the adults and the same tool was used to identify the needs of adults as perceived by experts. In both the rating scales, the body of the scale is same but instructions to rate the needs of adults are different. In one case the extent of the need felt by the adults was rated by them and in the other case the need of adults as perceived by the experts was rated by experts.

The items which were in the form of questions in the questionnaire were transformed into the form of
statements expressing the need. For example, each item had been given three alternate answers i.e., unnecessary, necessary and very necessary.

4.4 Pilot study:

For pilot study, the sample of 60 respondents were selected from the rural adults and 30 from the experts (10 doctors, 10 health workers and 10 adult education instructors). The tools were administered by the investigator. The objectives of the pilot study were as follows:

1. To find out whether the items included in the questionnaire and rating scale were relevant, easily understood and direct.

2. To find out whether the directions in the questionnaire and rating scales were clear and pointed, and

3. To find out adequacy of items to cover the objectives of the study.

The items in the knowledge questionnaire which were answered by 75 per cent and above of the sample and which were not answered by 25 per cent and less of the sample were rejected and the remaining items were selected for
inclusion in the questionnaire. Thus the number of items reduced to 130. Similarly the number of items in the rating scales was also reduced to 130 statements. Finally, the questionnaire or the rating scales consist of 30 items in seven areas as shown below:

<table>
<thead>
<tr>
<th>Area</th>
<th>No.of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Communicable diseases</td>
<td>38</td>
</tr>
<tr>
<td>ii. Non-communicable diseases</td>
<td>23</td>
</tr>
<tr>
<td>iii. First-aid</td>
<td>9</td>
</tr>
<tr>
<td>iv. Nutrition</td>
<td>19</td>
</tr>
<tr>
<td>v. Family planning</td>
<td>9</td>
</tr>
<tr>
<td>vi. Mother and child care</td>
<td>11</td>
</tr>
<tr>
<td>vii. Personal hygiene</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total:</strong></td>
<td><strong>130</strong></td>
</tr>
</tbody>
</table>

The questionnaire in Telugu, the questionnaire in English, key for the questionnaire, rating scale for adults in Telugu, rating scale for adults in English, rating scale for experts in Telugu and rating scale for experts in English are found at appendices I to VII respectively.

4.5 Validity of the tools used in the study:

i. **Face validity:** Lindquist (1966, p.672) says "a test is face valid, if it looks valid particularly to lay man. When the prepared questionnaire and rating
scales were read to illiterate adults and shown to literate adults and persons working in rural areas, who had no knowledge of construction of tools and also not familiar with the subject matter, they felt that they cover the major areas in the health and the selected items in these areas were more than sufficient.

ii. Content validity: Content validity indicates how adequately is the content of a test sampling the domain about which inferences are to be made. It is particularly important for knowledge tests. To restore this type of validity to the test, an attempt was made to see that all the areas of the health were included in the test constructed. Under each area, an adequate number of sample items were included. The preparation of test items was preceded by a thorough and systematic examination of related material in books and journals. Experts were also consulted. The items were revised in the light of the suggestions of the experts for content adequacy and accuracy. In view of these, it may be said that the tools possessed content validity.

4.6 Reliability of the tools used in the study:

There are four different methods of estimating the reliability co-efficients for a test, namely: i) Test-retest method, ii) Parallel form method, iii) The split-half method and iv) The method of Rational Equivalence.
In this study, test-retest method with a gap of 15 days was employed to establish the reliability. The sample covered in the test-retest method were 25 adults and 25 experts (5 doctors, 10 health workers, 10 adult education instructors). The test-retest reliability found was 0.8 for health knowledge questionnaire, .87 was for adults' rating scale, .83 was for experts' rating scale. The tools were highly reliable.

4.7 Scoring:
In the knowledge testing questionnaire, 1 and '0' marks were allotted for the correct and wrong responses respectively.

In the need assessment rating scale, the three-point scale was used, i.e., unnecessary, necessary and very necessary and the marks allotted for these three alternatives were '0' and 1 and 2 respectively.

The scoring pattern adopted both for the ratings given by adults and experts is same.

4.8 Locale and Sample:
For the purpose of the study, the investigator had selected twelve mandals randomly from all the three revenue divisions of Chittoor district which comprises of sixty five mandals as shown below:
<table>
<thead>
<tr>
<th>S1. Revenue No. division</th>
<th>Mandal</th>
<th>Rural Doc- Health workers</th>
<th>Adult education instructors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>sample</td>
<td></td>
</tr>
<tr>
<td>1 Tirupati</td>
<td>Chandragiri Yerpedu Renigunta Srikalahasti Puttur Nagari</td>
<td>130 30 30 30</td>
<td>30</td>
</tr>
<tr>
<td>2 Chittoor</td>
<td>Vadamalapet Bangarupalyam Palamaner</td>
<td>130 30 30 30</td>
<td>30</td>
</tr>
<tr>
<td>3 Madanapalle</td>
<td>C.T.M, Vayalpadu Kurablekota</td>
<td>140 40 40 40</td>
<td>40</td>
</tr>
<tr>
<td>Total:</td>
<td>400</td>
<td>100 100 100 100</td>
<td></td>
</tr>
</tbody>
</table>

Sample of 400 adults was drawn from the 43 villages selected by simple random sampling technique from the said 12 mandals.

The composition of the rural adults sample on the basis of their sex, marital status, age and educational status is as follows:

i) Sex
- Male 200
- Female 200

ii) Marital status
- Married 225
- Unmarried 175
iii) Age

<table>
<thead>
<tr>
<th>Age</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 to 35</td>
<td>198</td>
</tr>
<tr>
<td>35 and above</td>
<td>202</td>
</tr>
</tbody>
</table>

iv) Educational status

<table>
<thead>
<tr>
<th>Status</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>X and below</td>
<td>210</td>
</tr>
<tr>
<td>above X</td>
<td>190</td>
</tr>
</tbody>
</table>

The sample of experts (doctors, health workers, and adult education instructors) was chosen by random sampling method. Doctors, both private practitioners and government doctors, working in the Primary Health Centres, from the said twelve mandals as well as other mandals and headquarters hospitals at Madanapalli, Chittoor and Tirupati were selected. Health workers and adult education instructors were selected from the villages covered in the study.

4.9 Collection of data:

The required data were collected by the investigator from the respondents directly through the questionnaire and rating scales prepared for the purpose.

The purpose of administration of the tools was explained to the respondents. Care was taken to make the respondents answer all the items in the tools without hesitation at their convenience, in their houses.
The help of elementary school teachers and adult education instructors was taken by the investigator in collecting the data from the rural adults. The questionnaires were distributed to the adults and the purpose was explained. They were given sufficient time to answer the questionnaire. In case of semi-literate and literate adults, the investigator herself marked the responses given by them. The same procedure was followed in collecting data for the need assessment rating scale. Time gap at least one day was given between the two testings. Health knowledge questionnaire was first administered and later in need rating scale. The need assessment tool was given to the doctors and the purpose was explained. They were requested to rate the health needs of rural adults as they (doctors) perceive the needs of the adults. The filled in forms were collected on the next day.

The health workers attend the meetings held at the PHC every month. On that specified date, data were collected by the investigator by requesting the hospital authorities to collect the data from them by using the rating scale.

Elementary school teachers act as in-charge supervisors in the literacy programme. So their help was sought
in collecting the data from the adult education instructors.

4.10 Tabulation of data:

Data thus obtained must be tabulated on separate sheets. For that purpose scoring must be done. In the knowledge test, '1' mark for right response and '0' mark for wrong response was given. The key for health knowledge questionnaire is found at appendix III. The need assessment items were scored as '0' and 1 and 2 for unnecessary, necessary and very necessary alternatives respectively. So these scores were marked against each individual for that specific item and each individual was given scores for all the items in the questionnaire or the rating scale. The data thus tabulated were used for further calculations.

4.11 Statistical Techniques used in the Study:

The following techniques are employed for realising the different objectives of the study:

i. To assess the knowledge level of the adults, the raw scores were used. The highest and the lowest scores in the area were identified. The range was found. The obtained range was divided into three parts, so that three groups can be formed - very
high, high and low, taking into account the maximum and minimum score of each group. The number of persons falling in each group was noted and percentages were calculated.

ii. In the same manner, the need level of the adults as expressed by them and the need level of adults as perceived by experts were found out.

iii. In order to assess the significant difference in the knowledge, or need of adults in different areas of health, the raw scores were not used, since the number of items in the questionnaire or rating scale were not equal and the maximum attainable score in each area is not the same. Therefore the raw-scores were converted into standard scores raising to 100, by using the formula

$$\frac{x}{\text{maximum area score}} \times 100,$$

where $x$ = individual's raw score

The standard scores were used to find out the significant difference. ANOVA technique was employed. When 'F'-test indicated significant difference, then, t-test was used to find out where exactly the difference exists.
iv. To find out the relationship between the knowledge and need of rural adults in different areas of health, co-efficient of correlation was calculated.

v. To assess the influence of age, sex, marital status and educational qualifications of rural adults on their health knowledge and need, the difference between two means was tested for significance by using t-test.

vi. To find out the significant difference in the perceived health needs in different areas of health among experts, raw scores were used, because the comparison is among them (experts), on their knowledge or need in a area and not on their knowledge or need among different areas of health. As usual, ANOVA, Technique was used to find out the significant differences.

vii. To find out whether there exists any difference in the perceived health needs of experts and expressed needs of adults, the difference between two means was tested for significance by 't'-test.

viii. To determine the priority of the items (topics) for the inclusion in the curriculum content of health education, the mean scores of knowledge of
the adults on each item was found and the mean score of lack of knowledge on each item was calculated. The priority of the item was decided by averaging three indices of the item - lack of knowledge of the adult, need expressed by the adult and the need of the adult as perceived by the experts.

Curriculum content is designed on the basis of the knowledge and need of the target population and also the experts opinion. The general assumption is that experts will be able to judge the content requirements of the target group and that there exists negative relationship between knowledge and need of the target group. In the present study also, the same trend is revealed between knowledge and need. Therefore, lack of knowledge is taken as a measure of need. It is likely that adults may not express the need on certain items, though they lack knowledge, as they have not properly understood the present importance of knowledge on those items. But on that account, such items cannot be ignored and it is essential to sensitize the adults on the significance of the knowledge base on such items.

The findings of the study are found in the next chapter.