CHAPTER IV

METHODOLOGY

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METHODOLOGY

In any research, methodology is an inevitable part. According to Barr, Davis and Johnson (1953), after a problem is defined and delimited, the materials, methods and scope of the investigation should be outlined and described.

Methodology occupies a decisive role in any kind of research, as the validity and reliability of the findings depends upon the methods adopted. By methods, it means a range of approaches used in educational research to gather data, which are to be used as a basis for inference and interpretation, for explanation and prediction.

If methods refer to the techniques and procedures used in the process of data gathering, the aim of methodology is to describe and analyse these methods, throwing light on their limitations and resources, clarifying their presuppositions and consequences relating to their potentialities to the twilight zone at the frontier of knowledge. It is to venture generalizations from the success of particular techniques, suggesting new applications and to unfurl the specific learning of logical and metaphysical principles on concrete problems, suggesting new formulations.

A suitable method helps the researcher to explore the diverse stands of the study and adequately measure them so as to satisfy the requirements and thus it is the means to an end.
This chapter is devoted to the description of the method of investigation followed in the study. The method adopted, tools and techniques used, development of tools, their description, sample selected, procedure for data collection, and statistical techniques adopted for analyzing the data have also been discussed in this chapter.

4.1 Method Adopted

The method adopted should always be valid, reliable and appropriate to the nature of the problem under investigation and the kind of data that the problem demands.

The present-study is intended to highlight the Educational and Vocational programmes provided in the juvenile and observation homes in correcting the behaviour of juvenile delinquent. Besides, the supplementary programmes related to recreation, health, and spiritual were also included with an objective to find out how these programmes affect the juvenile delinquents in a positive way. Hence the Investigator adopted normative method for the present investigation in which the survey is the technique used. The word normative is used because surveys are frequently made for the purpose of ascertaining which is normal or typical condition or practice.

The normative survey method is that method of investigation, which attempts to describe and interpret what exist at present in the form of conditions, practices, process, trends, effects, attitudes,
beliefs etc. It is concerned with some phenomena that are typical or normal conditions.

According to Sukhia (1974) “The survey method determines present trend and solves current practical problems”. The survey is the type of research most widely used in educational research. “Educational Surveys are particularly versatile and practical especially for an administrator, in that they identify present conditions and point to the present needs” (George, 1964).

Different types of surveys help to establish the status of the phenomenon under investigation. The purpose is to survey the present conditions, understand relationships, and base future action on the findings. Surveys can be confined to fact-finding on large number of areas or they can be complex and sophisticated in design providing accurate findings. Adoption of the survey method in the present study helped the researcher to collect proper data from an adequate number of juvenile and observation homes from Kerala. Normative survey research may involve one or more of these elements in different situations. It is concerned, not with the characteristics of individuals but with the characteristics of the whole population.

4.2 Sample for the Study

Sampling is the process by which a relatively small number of individuals or measures of individuals, objectives or event is selected and analysed in order to find out something about the entire population from which it was selected. An optimum sample, states
Parton (1959), “is one which fulfills the requirements of efficiency, representativeness, reliability, and flexibility. The same should be small enough to avoid unnecessary expenses and large enough to avoid intolerable sampling errors.

The population of the present study consists of the institutionalized juvenile delinquents between the age group of 13-18 years, of the five juvenile and observation homes in Kerala which approximately will be 300. Institutionalized Juvenile Delinquents even though found in 17 institutions in Kerala, out of these, 10 are Observation Homes. Among these 10, one institution is recently started for girls where attached juvenile homes are absent; 5 institutions have both juvenile and observation homes. 2 are special homes which are located in Trivandrum and Kozhikode. A list of such institutions are given below.

### Table 4.1
**Observation Homes in Kerala**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Observation Homes</th>
<th>Sex of inmates</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Alappuzha</td>
<td>Boys</td>
</tr>
<tr>
<td>2.</td>
<td>Ernakululam</td>
<td>Boys</td>
</tr>
<tr>
<td>3.</td>
<td>Pathanamthitta</td>
<td>Boys</td>
</tr>
<tr>
<td>4.</td>
<td>Kozhikode</td>
<td>Boys</td>
</tr>
<tr>
<td>5.</td>
<td>Kozhikode</td>
<td>Girls</td>
</tr>
<tr>
<td>6.</td>
<td>Thalassery</td>
<td>Boys</td>
</tr>
<tr>
<td>7.</td>
<td>Palakkad</td>
<td>Boys</td>
</tr>
<tr>
<td>8.</td>
<td>Malappuram</td>
<td>Boys</td>
</tr>
<tr>
<td>9.</td>
<td>Kasargod</td>
<td>Boys</td>
</tr>
<tr>
<td>10.</td>
<td>Wayanad</td>
<td>Boys</td>
</tr>
</tbody>
</table>
Juvenile home alone are not found in any of the institutions. The other five institutions in Kottayam, Kollam, Trivandrum, Thrissur and Kozhikode have both Juvenile and Observation Homes. These institutions only were selected for the study.

Out of this population of 300, the sample selected for the study consists of 142 delinquents selected from 5 Juvenile/Observation homes in Kerala. Due to frequent arrivals and frequent release of Juvenile Delinquents after each trial, the Investigator is forced to limit the sample to 142. New arrivals and the delinquents who are just to be released cannot be included in the sample. Besides this, the principals, teachers and caretakers were also included in the sample. The details of sample selected are given in the table.

Table 4.2

Break up of the sample selected for the study

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Juvenile/ Observation Homes</th>
<th>No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>J/OH, Poojappura, Trivandrum</td>
<td>31</td>
</tr>
<tr>
<td>2.</td>
<td>J/OH, Beachroad, Quilon</td>
<td>29</td>
</tr>
<tr>
<td>3.</td>
<td>J/OH, Thiruvanchur, Kottayam</td>
<td>34</td>
</tr>
<tr>
<td>4.</td>
<td>J/OH, Ramapuram, Trichur</td>
<td>29</td>
</tr>
<tr>
<td>5.</td>
<td>J/OH, Vellimadakunnu, Kozhikode</td>
<td>19</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>142</strong></td>
</tr>
</tbody>
</table>
4.3 Tools and Techniques Used

Factual materials unknown so far are necessary for every study. They can be obtained from many sources, direct or indirect. Selection of suitable instrument or tools is also of vital importance in every research study. According to Best (1992), “Like the tools in the Carpenter’s box, each research tool is appropriate in a given situation to accomplish particular purpose”. For the purpose of the study, it was decided to make use of certain important tools and techniques.

The main tools and techniques employed in the study were;

I. Programme Inventory
II. Questionnaire
III. Juvenile Home Information Schedule.
IV. Juvenile Behaviour Checklist
V. Structured and Unstructured, Interviews
VI. Observation
VII. Case Study

Of these seven tools, six namely (1) Programme Inventory, (2) Questionnaire (3) Juvenile Information Schedule and (4) Structured and unstructured Interviews (5) observation and (6) case study were prepared and conducted by the Investigator herself with the help of the Supervising Teacher. Juvenile Behaviour Checklist, was borrowed from Shalini Devi (1990), of Madras University.
4.4 Development of the Tools

The tools developed by the Investigator and used in the study are given below.

I. Programme Inventory

Programme Inventory is the major tool made use of in the Investigation for assessing the various programmes of different juvenile/observation homes.

Preparation

For the preparation of the programme Inventory, the Investigator sought the help of the supervising teacher and went through the relevant literature such as research studies, records of social welfare departments, the encyclopedia of educational research, articles in the periodicals etc for collecting facts for the study. The experienced clinical psychologists, and educationalists were also contacted personally and held discussions with them. (List attached in appendix). The govt. officials of social welfare department, superintendent of the juvenile and observation homes, administrative authorities and others were contacted to have an insight about the activities in which they were mainly involved, keeping in view the modification of the behaviour of delinquents. Then the Investigator visited various juvenile and observation homes to become familiar with such institutions and had informal talks with the caretakers, and teachers to get an idea about the different situations, activities and programmes that are going on there.
Programme Inventory is meant to know mainly the Educational and Vocational programmes provided in juvenile and observation homes. Besides, some of the supplementary programmes related to recreation, health and spiritual aspects were also included while constructing the tool. Data were collected from the delinquents, teachers, and others who are associated with such institutions.

**Components of the Programme Inventory**

- **Section I** - Personal data
- **Section II** - Educational programmes both curricular and Co-curricular.
- **Section III** - Vocational programmes.
- **Section IV** - Recreational programmes.
- **Section V** - Health programmes
- **Section VI** - Spiritual programmes

**Description of each of the components**

1. **Personal data:**- This section is to get the personal information about the delinquents in the institutions such as their name, school, class, management, locality of institution etc.

2. **Educational programme:**- It includes both the curricular and co-curricular programmes conducted by the institutions. The curricular programmes are mainly intended to know whether the curricular objectives are realised by the Institutions through the teaching-learning process, such as methods of teaching, medium of instruction, homework, evaluation process etc, making some changes in the behaviour of the delinquents.
Co-curricular activities include the formation of different clubs such as Arts club, Science club, Social science club etc. which promote the creative ability of the pupils, facilities for physical education, activities of N.C.C, Scout, N.S.S etc. which help to develop leadership qualities, and sharing and ‘we feeling’ among the delinquents, and the celebrations of National as well as the international days, school day competitions, and field trip—which provide sound mind to the delinquents.

3. Vocational Programme: This component is added to programme inventory to know whether there is any change in the behaviour of juvenile delinquents by making them involved in vocational programmes and helping them to earn a livelihood. Vocational programmes include stitching, weaving, carpentry, automobile, air conditioning etc. which the inmates can select according to their taste, and preferences, and which give pleasure to them. Besides this, such programme can channelise the delinquent acts and criminal tendencies to creative and constructive areas. This part helps to know whether these programmes are beneficial to the delinquents or not.

4. Recreational programme: This section deals with the recreational activities provided in juvenile and observation homes to the delinquents. This includes watching of the T.V
programmes, and listening to the radio talks, and also taking them for trip, i.e. activities that give enjoyment to them.

5. Health programme: This section includes the health programmes given by the juvenile and observation homes; it helps to know whether each of these institutions has its own doctor, whether they are getting any classes on ‘health’, ‘cleanliness’...etc.

6. Spiritual Programme: The items included in spiritual programme are to know whether the inmates are getting spiritual advice from the institution, whether it has any positive impact on their behaviour or not etc. The total number of questions prepared and included in the draft inventory under different aspects was 67.

II. Questionnaire:

“According to Good 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”.

Keeping in view the major objectives of the study, the Investigator decided to prepare a questionnaire for evaluating the programmes which are given in the juvenile and observation homes from the point of view of the inmates. For the preparation of the questionnaire, the Investigator collected and read a wide range of books, journals, dissertations etc. Then held discussions with the
leading and eminent educationists and experts in the field. (List attached in Appendix)

**Item Preparation**

It was decided to include only closed type items in the questionnaire. Extreme care was taken to word the items in order to avoid ambiguity or indication of hidden meaning for securing information. Other precautions regarding the desirability of a good item in the questionnaire suggested by Best & Khan, (1992) were taken.

The questionnaire is mainly to evaluate the Educational and Vocational programmes provided in the juvenile and observation homes for the delinquents, and supplementary programmes were also included for evaluation.

In this questionnaire there are three sections, the first section is to evaluate the educational programmes both curricular and co-curricular; the second section deals with the evaluation of the vocational programmes: some of the questions included in this section are (1) Will the given vocational programmes be beneficial to you in future? Do they provide enough training facilities for you? Suggestions were also asked for the betterment of the vocational programmes. The third section is concerned with the evaluation of recreational, health and spiritual programmes provided in the juvenile and observation homes. Altogether there were 58 questions in the draft questionnaire.
Try out: A try out of the draft questionnaire and programme inventory were made on a sample of ten juvenile delinquents selected from J/OH Kottayam to find out the practical difficulties if any in the administration of these tools. Try out helped the Investigator to remove the vague and ambiguous questions from the questionnaire. Number of questions have been reduced to 50 and 36 to inventory and questionnaire after the try out.

b. Scoring

The subject is required to respond to each item given in the questionnaire by marking ‘Yes’ or ‘No’. Each ‘Yes’ response will receive a unit score while a ‘No’ response would receive “Zero” score. The score of a subject is the sum of the scores obtained by him/her in all the items of the questionnaire and inventory.

Validity and Reliability of the tools

According to Best and Khan (1995) validity and reliability are essential to the effectiveness of data gathering procedure.

Validity is that quality of data gathering instrument or procedure that enables it to measure what it is supposed to measure. Reliability is the degree of consistency that the instrument or procedure demonstrates: what it is measuring, it does so consistently. Reliability is a necessary but not sufficient condition for validity. That is, a test must be reliable for it be valid, but a test can be reliable and still not be solid.
All possible measures were adopted to establish the validity and reliability of the tools used for this study. But it is not possible to adhere to statistical procedure for measuring instruments like inventory and questionnaires which need not be subjected to item analysis. It is not possible to drop any question on the basis that it is either difficult or easy because the investigator is assessing and evaluating the various programmes provided in the J/OH’s to correct the behaviour of the juvenile delinquents. The questions are so simple that even an inmate of an average ability can easily answer them. The investigator therefore relied mostly on non statistical procedure to determine the validity and reliability of the questionnaire and inventory prepared.

**Validity:** Regarding the methods of establishing the validity of a questionnaire Mouly (1970) states “at the most elementary level, it is necessary for all the questionnaires to have content validity”. i.e a question must be related to the topic under the investigation: there must be an adequate coverage of the over all topic; the questionnaires must be clear and unambiguous. Due care was taken to meet these requirements of the tools; efforts were made to improve the items in the questionnaire in consultation with the experts in the field.

The validity of the inventory has been answered in terms of definition and representation given to the concept under
measurement. The criterion of content validity is often assessed by a panel of experts in the field who judge its adequacy, but there is no numerical way to express it. (Best and Khan 1999).

Construct validity of the test may be said to measure a theoretical construct or trait (Anastasia, 1961). Construct validity of the questionnaire and inventory was ensured by giving simple and unambiguous items. Moreover, pilot testing of these tools also helped to establish the validity. While constructing the questionnaire and inventory all customary practices were observed as closely as possible. Thus utmost care was taken by the investigator to see that the questionnaire and inventory used for the study had content and construct validity.

**Reliability:** The reliability of the questionnaire and inventory was estimated by the test-retest method. In the test-retest method these questionnaire and inventory were administered twice on same sample of 30 juvenile delinquents each. And the tools were administered with an interval of two weeks. The scores of the individuals in these two tests were found out. The Pearson’s product moment coefficient of correlation between the two scores were calculated. The test-retest reliability coefficient thus obtained for the questionnaire is 0.74 and for the inventory is 0.67.
**III. Juvenile Home Information Schedule**

In order to gather factual information about various aspects of juvenile and observation homes, the Investigator prepared an information schedule and gave it to the heads of the institutions.

**Description of the Information Schedule**

Information schedule consists of 2 sections:- personal data and physical facilities. Physical facilities section consists of 5 sub sections.

Section I- It is to obtain the personal data about the head of the institution such as his name, experience, name of the present working juvenile home ...etc.

Section II –This section enquires about the availability of the physical facilities in J/OH’s.

- **a) Space:** Is there adequate space in teachers room, principals room, play ground, library, laboratory...etc?

- **b) Equipment:** To know whether there is adequate equipment in teachers room, library, laboratory, hospital etc.

- **c) Library:** To know whether there are adequate books, reference items, magazines, chart, map, globe....etc;

- **d) Laboratory equipment, hospital infrastructure such as observation room, Doctor’s room, Nurses room, etc; the Juvenile Justice Board, room for Magistrate etc.**
e) Materials or indoor and outdoor games:- To assess the availability of materials for indoor and outdoor games such as chess, carroms, football, ... etc.

f) Personnel administrators:- To know whether there is adequate personnel such as office assistants, computer assistants, Security, Doctors, Nurses & Laboratory assistants .... etc.

**IV. Juvenile Behaviour Checklist**

Juvenile behaviour checklist is a borrowed tool prepared by Shalini Devi (1990) of Madras University. It is a device to know the behavioural changes of the delinquents after undergoing such programmes in Juvenile/Observations Homes. The questions included here are to know about their laziness, discipline, daily routine in the life, academic matters such as homework, interest in study, aims in life, withdrawn character and the criminal characters... etc. The changes in the behaviour may be indicated by putting ‘Yes’/’No’ options. The delinquents were asked to put a ✅ mark against the appropriate columns indicating the option.

**V. Interviews**

Interview is a process of communication or interaction in which the subject gives the needed information verbally in a face to face situation. It is an important technique to supplement objective evidence about a phenomena by giving first hand knowledge.

In the present study the Investigator conducted structured and unstructured interviews.
(i) Structured Interview

Structured interview is conducted with the help of interview schedule.

Structured interviews are rigidly standardized and formal and the same questions are presented in the same manner and order to each subject and choice of alternative answers is restricted to as per the predetermined list. Five Principals and the Directors of the concerned J/OH’s were selected to obtain the relevant information about the attitude of inmates towards the schooling in these J/OH’s, the types of vocational training provided, adequacy of funds, and present status of these institutions, and finally to get suggestions for improving the institutions.

(ii) Unstructured Interview

Unstructured interviews are flexible: few restrictions are placed on respondents’ answers. Even if preplanned questions are asked; the queries are altered to suit the suitable subjects. The Investigator conducted unstructured interview with the superintendent of Social Welfare Department, because the Govt. juvenile and observation home is under the direct control of Social Welfare Department. The interview is to get information about the situation in which the child is arrested and send to juvenile homes, and about the working of juvenile court, leadership training, group life etc.

In order to know the problems experienced by the teachers and caretakers, the Investigator informally conducted an interview with
them by randomly selecting one teacher and one caretaker from each of the 5 J/OH’s.

VI. Observation

Observation is recognized as the most direct means of studying people when one is interested in their overt behaviour. Observation is specific with carefully defined things to look for research purpose; observation of J/OH’s is systematic and well planned. The purpose of observation is to perceive the facilities provided in J/OH’s and the activities and programmes going on there. The Investigator also observed directly the inmates behaviour towards the Director, teachers and caretakers too.

VII. The Case Study

The case study is a way of organizing social data for the purpose of viewing social reality. The case study probes deeply and analyses interactions between the factors that explain present status or that influence change or growth (Best and Khan, 1995). In case study a “single case” is studied in depth. This could be an individual, one group of students, a school, a programme, an institution or a concept. The purpose is to understand the person(s) or phenomena. In case study the data consist of words in the form of rich verbal descriptions, rather than numbers. Data for case study is gathered through observation, interview, discussion and recorded data from documents.
Selection of sample is crucial in the conduct of case studies. Purposeful sampling technique would be quite appropriate when one wants to understand something about the select case. In the present investigation, one J/OH (J/OH Trivandrum) was selected to get a comprehensive view regarding educational, vocational and supplementary programmes, the staff, finance and facilities. This case was purposely selected since it has highest facilities and high programmes.

4.5 Procedure for Data Collection

The Investigator contacted the Directorate of Social Welfare Department, Thiruvananthapuram to get permission for collecting the data from five juvenile and observation homes such as Kottayam, Trivandrum, Kollam, Trichur and Kozhikode. After getting the permission from the Welfare Department, the Investigator met the superintendent of the juvenile and observation homes and informed him/her about the purpose of the visit and got permission to collect the data.

After getting permission from the head of the institutions, the Investigator introduced herself and explained the purpose, and gave instructions to the juvenile delinquents. In addition to this, indications were given in printed form too. Investigator adopted several techniques to collect genuine data from the delinquents.

It is also to be noted here that all the respondents were very cooperative with the Investigator when it was explained to them that
it was purely an academic study and that personal identity and other information would be held strictly confidential. The issue of becoming a juvenile delinquent (if criminal) was always delicate and often painful for the respondents to remember and relate. Therefore, the investigator had to spend considerable time with each delinquent to establish a rapport (in the presence of the authorities) and win their confidence in order to collect the relevant information.

The Investigator personally contacted the teachers, caretakers, the instructors of the vocational training programmes and the officers to obtain a clear picture about the educational and vocational programmes of juvenile and observation homes.

The Investigator then went in and around the school along with the teachers and discussed the functioning of the school and conducted unstructured interviews with them. They cooperated well and gave a good picture about their programmes.

All the tools such as Programme Inventory, Questionnaire, Juvenile Behaviour Checklist and Juvenile Home Information Schedule were administered one after the other on different respondents and collected back after filling up.

The Investigator observed the students, in their classrooms, and outside, in the hostels, playgrounds and their interaction with teachers, classmates etc. And also observed the behaviour of head teachers, their dealings with colleagues, students and even with some of the parents of the students. The entire staff were very cooperative.
The Investigator finally conducted the case study on J/OH Trivandrum. For this purpose all the reliable sources of information relating to J/OH were collected. Data were collected from all the relevant persons and documents. Observation and interviews were also used for collecting the data.

**Consolidation of Data**

The responses collected from the samples under study using programme inventory, questionnaire, juvenile behaviour checklist, and juvenile home information schedule were codified appropriately and used for statistical analysis.

**4.6 The Statistical Techniques Adopted**

The statistical techniques used in the present study for the analysis and interpretation of the collected data are the following.

1. **Percentage**

   Percentage = \( \frac{R}{S} \times 100 \)

   Where,
   
   \( R \) = number of responses
   
   \( S \) = total number of sample

2. **Significant difference between percentages**

   \( N = \frac{N_1P_1 + N_2P_2}{N_1 + N_2} \)

   \( Q = 100 - P \)

   \( \sigma D\% = \sigma P_1 - P_2 = \sqrt{PQ \left( \frac{1}{N_1} + \frac{1}{N_2} \right)} \)
C.R = \frac{(P_1 - P_2) - 0}{\sigma P_1 - P_2}

N_1 = \text{Number of responses of the first group}

N_2 = \text{Number of responses of the second group}

P_1 = \% \text{ of responses of the first group}

P_2 = \% \text{ of responses of the second group}

3. Computation of Arithmetic Mean

This technique is used to compare two groups. The formula for calculating arithmetic mean is given below.

\[ \text{A.M.} = \frac{\sum fx}{N} \times \frac{\sum fx}{N} \]

Where

F = frequency

X = score

N = Total frequency

4. Median

It is used to know the position of scores; this can be calculated by this following formula.

\[ \text{Mdn} = L + \left[ \frac{N - f}{fm} \right] i \]

Where

L = Exact lower limit of the class intervals upon which the median lies.

N/2 = One-half of the total number of scores
5. Measures of Dispersion

It is the measure of the scatter or spread of the separate scores around their averages. So the measures of dispersion add meaning to the measures of averages.

6. Standard Deviation

It is the square root of the sum of the square of the deviations of each observation from the mean and divided by the size of the sample. This is used to find out the dispersion of the scores and the formula is

\[ \sigma = \frac{i \sqrt{\frac{N\sum f^2 x^2}{N}}}{N - (\sum f x^2)^2} \]

(Garret, 1979)

In which

\( I \) = Width of the class intervals
\( N \) = Total number of scores
\( F \) = Frequency of the class intervals
\( X' \) = Derivation of the raw score from the assumed mean divided by the length of class interval.
7. **Measures of Divergence from Normality: Skewness**

This technique is used to measure divergence from normality and the formula is

$$\text{Sk} = 3 \left( \frac{\text{mean} - \text{median}}{\sigma} \right)$$

8. **Kurtosis**

“A measure of peakedness of a distribution indicating the degree to which a set of scores is concentrated around its mean”. It is calculated by using the formula

$$\text{Ku} = \frac{P_{75} - P_{25}}{2 (P_{90} - P_{10})}$$

Where,

- $P_{75}$ = 75\textsuperscript{th} percentile
- $P_{25}$ = 25\textsuperscript{th} percentile
- $P_{90}$ = 90\textsuperscript{th} percentile
- $P_{10}$ = 10\textsuperscript{th} percentile

9. **ANOVA**

This technique is used to compare the means of more than two groups of samples whether the difference is significant or not, and formula is

$$\text{SSb} = \frac{(\Sigma x_1)^2}{n_1} + \frac{(\Sigma x_2)^2}{n_2} + \ldots - \frac{(\Sigma x)^2}{N}$$

$n$ = The number of subject in a group

$N$ = The number of subjects for all groups combined

(Best and Khan, 1995)
10. Correlation

The word correlation means closeness or relationship b/w to sets of variable. The single number which describes the extents of correlation is called correlation coefficient, denoted by ‘r’

\[
r = \frac{\sum XY - N\overline{X}\overline{Y}}{\sqrt{(\sum X^2 - N\overline{X}^2)(\sum Y^2 - N\overline{Y}^2)}}
\]

Verbal interpretation of correlation according to Garret (1969), Correlation ‘r; can be interpreted as follows:

- r from .00 to ± .20 - Denotes in different or negligible relationship
- r from ± .20 to ± .40 - Denotes low correlation present but slight.
- r from ± .40 to ± .70 - Denote substantial or marked relationship
- r from ± .70 to ± .100 - Denote high to very high relationship

11. The significance of r’s

\[
t = \frac{r \sqrt{N - 2}}{\sqrt{1 - r^2}}
\]

12. Significant difference between two r’s

Convert r’1 & r’2 into Z1 & Z2

\[
C.R = \frac{Z_1 - Z_2}{\sqrt{\frac{1}{N_1 - 3} + \frac{1}{N_2 - 3}}}
\]  
(Garret 1969)