Chapter 4

Methodology
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METHODOLOGY

Research methodology is defined as a highly intellectual human activity used in the investigation of nature and matter and deals specifically with the manner in which data is collected, analysed and interpreted. It is a way to systematically solve the research problems. It is a science of studying how research is to be carried out. Essentially, the procedures by which researchers go about their work of describing, explaining and predicting phenomena are called research methodology. It is also defined as the study of methods by which knowledge is gained. Its aim is to give the work plan of research. This chapter deals with research design, participants, and description about the tools, procedure and statistical analysis.

4.1 RESEARCH DESIGN

Research design refers to the plan, structure, and strategy of research—the blueprint that will guide the research process. It is a detailed outline of how an investigation will take place. A research design will typically include how data is to be collected, what instruments will be employed, how the instruments will be used and the intended means for analyzing data collected. In Fisher’s tradition, research design contains activities like procedure for selection of factors and their levels for manipulation, identification of extraneous variable that need to be controlled, procedure for handling experimental units and selection of criterion measure. A research design also acts as a control mechanism. It enables the researcher to minimize unwanted variance. Variance describes the extent to which the score differ from each other.

The main functions of experimental design are: to maximize the effect of systematic variance (systematic variance is variability in the
dependent measure due to the manipulation of the experimental variance by the experimenter), to control the extraneous source of variance, to minimize the error variance (all other source of variation in experiment). The analysis of variance (ANOVA) deals with variance. ANOVA permits us to find out significance of difference between three or more means at one time. ANOVA explains difference between the entire mean at the same time as well as interactive effect.

In the present study factorial design has been used. Independent variables are manipulated through selection and extraneous variables are controlled through selecting groups matched on extraneous variables.

Duration of taking cocaine and alcohol is independent variables manipulated through selection. The duration of taking cocaine and alcohol varied at three levels e.g. one year, three years and five years. The normal group was taken to compare with experimental group.

The dependent variables are response variable. The responses of the subjects were measured for memory, personality and concept formation by valid psychological tests. Memory was assessed with P.G.I. memory scale which includes ten different sub-tests of memory. To measure personality Eysenck Personality Questionnaire was used. For concept formation Hansmann&Kasanin(1937) concept formation test was used. To measure the effect of counselling session GAF scale (Axis- V of DSM- IV TR) was used.

4.2 PARTICIPANTS(SUBJECTS)
The subjects of this study were selected from Delhi, Lucknow, Varanasi and Faizabad districts. The researcher asked subjects "from how many years do you take cocaine or alcohol", and on the basis of
their replies they were selected. The groups were formed on the basis of duration of using drugs. The groups were:
Cocaine user (1 year)
Cocaine user (3 year)
Cocaine user (5 year)
Alcohol user (1 year)
Alcohol user (3 year)
Alcohol user (5 year)
Normal subjects
In each group there were thirty subjects. Purposive sampling technique was applied to select the subject. The groups of cocaine and alcohol addicts were the experimental group of the study while the group of normal subjects has been selected as a control to compare the experimental group. The composition of groups along with control variable has been presented in table 2.

Table 2- Representing the distribution of subjects in each group.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Subjects of seven groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>210</td>
</tr>
<tr>
<td>Age</td>
<td>21-50 years, M = 35.5 years</td>
</tr>
<tr>
<td>Sex</td>
<td>Male and female</td>
</tr>
<tr>
<td>Education</td>
<td>Intermediate to post graduate</td>
</tr>
<tr>
<td>Socio-economic status</td>
<td>Higher, middle and lower</td>
</tr>
<tr>
<td>Domicile</td>
<td>Rural and urban</td>
</tr>
<tr>
<td>Duration of taking cocaine or alcohol</td>
<td>One year, Three years, Five years</td>
</tr>
</tbody>
</table>

Age: Subject’s age ranged from 21 to 50 years.
Sex: Male and female both were selected for this research
Education: Subjects from intermediate, graduate and post graduate standards were selected for study.
Socio-economic status: Subjects were taken from all the socio-economic status.
Domicile: The subjects were taken from urban and rural areas.
4.3 TOOLS
To collect the data the researcher has used the following tests:

4.3.1 Case study sheet - To get the appropriate sample for the study the case study sheet was used. In this sheet information regarding the subjects was coded. The points of this sheet were- name and age of the subject, gender, education, duration of taking drug, domicile and occupation etc.

4.3.2 P.G.I. Memory Scale (PGIMS) - PGIMS was used to test the memory ability of the subjects. This test was developed by Dwarka Prasad and N.N. Wig from Dept. of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh. PGIMS was constructed and standardized in 1977. It contain ten subtests- remote memory, recent memory, mental balance, attention and concentration, delayed recall, immediate recall (sequential reproduction of sentences), retention of similar pairs, retention of dissimilar pairs, visual retention and recognition.

Standardization: -The standardization of PGIMS was done on the subjects in the age ranged 20- 45 while Mean and Standard deviation were provided for the subjects up to the age of 69 years. Quintile norms were developed for three educational levels i.e. 0-5, 6-9, and 10 plus years of schooling. This test was equally valid for both sexes and applicable and acceptable to illiterate and unsophisticated subjects.

Reliability: The reliability of the PGIMS was calculated test- retest reliability coefficient with one-week interval. The test- retest reliability ranged between 0.70 to 0.84 for organic- psychotic groups, 0.48 to 0.84 for neurotic- normal group.

Validity: PGIMS was found to have a correlation of 0.71 with Boston Memory scale and 0.85 with Wechsler memory scale.
**Scoring:** The scoring for different subtests are as follows:

Sub-test I and II- One score for each correct response. Maximum total will be 6 and 5 respectively.

Sub-test III Alphabet and counting backward- 3 scores if all correct within 15 seconds, 2 if longer than 15 seconds, 1 if there is one mistake or omission, separately alphabet and backward counting.

Counting backward by 3’s- 3 scores if all correct within 30 seconds, 2 if takes longer than 30 seconds, 1 if there is one error or omission.

Sub-test IV- Summation of digits forward and backward is the score for this subtest.

Sub-test V- One score for each word correctly recalled (total 10).

Sub-test VI- One score for each clause correctly reproduced (maximum score 12).

Sub-test VII- One score for each correct reproduction of the associated word of the pair (total 5).

Sub-test VIII- One score each for the correctly reproduced pair, separately for each trail. Summation of scores on three trails is the score (total 15)

Sub-test IX- One score for each type of geometrical figure correctly reproduced in sequence and number. Thus card 1 to 3, 2 scores each, card 4, 3 scores and card 5, 4 scores (total 13)

Sub-test X- Each object correctly recognized and named is to be given a score of one. Numbers of wrong identified objects are to be deducted from the earned score (total 10).

**Administrations:** - Administration of this test is simple and similar to other memory tests and clinical evaluation of memory. Broad hints for
administration are provided in test blank itself. Administration takes nearly 15-20 minutes.

4.3.3 Eysenck Personality Questionnaire (Hindi adaptation): For this study Eysenck Personality Questionnaire (Hindi adaptation) was used. This test was originally developed by Eysenck in 1975 and Hindi adaptation of this test was done by G.P. Thakur and Manju Thakur.

The 101-item E.P.Q. (Eysenck & Eysenck, 1975), which measured Psychoticism, Extraversion, Neuroticism and Social Desirability set was translated into Hindi language. Out of 101 item of English EPQ only 90 items were to be scored and 11 unscored items were meant for substitution in other culture of the world ascertaining relevant psychometric properties.

This test contains four scales: Psychoticism, extroversion, neuroticism and lie scale.

Standardization: The standardization of EPQ was done on the subjects in the age ranged 17-75 years with a mean age of 35.93 years. The sample consisted of 611 males and 502 female.

Reliability: The test retest reliability was calculated for four scales, the gap between the two administrations being six weeks, on 176 males and 164 females of the same group. The findings are reported in table 3.

Table-3 Representing the Test- Retest reliability

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>P</th>
<th>E</th>
<th>N</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>176</td>
<td>0.72</td>
<td>0.83</td>
<td>0.89</td>
<td>0.74</td>
</tr>
<tr>
<td>Female</td>
<td>164</td>
<td>0.77</td>
<td>0.82</td>
<td>0.88</td>
<td>0.73</td>
</tr>
</tbody>
</table>

Administration: The Administration of the Hindi version of the E.P.Q. is very straight-forward. This may be administered in a small
group of individually as per requirements of the situation. Instructions printed on the top page of the questionnaire are quite clear. These are:

There are some questions, which have two alternate answers ‘YES’ or ‘NO’. You have to tick (√) the answer which you think most appropriate for you. No answer is right or wrong. The purpose of this questionnaire is to know your reaction only. So read the question attentively and mark the question carefully. Be quick and do not waste your time on any question by thinking.

They should be asked complete the questionnaire at the earliest possible. No time limit is recommended, however, a decision on the matter may be taken seeing the requirement of the testing.

Scoring: Filled-in questionnaire should be scored with the help of the scoring ley as shown in the manual. The scale contains 107 items but only 80 items are to be scored. The maximum score of each dimension is as follows:

**Psychoticism Dimension:** The maximum score one could get was 17 and minimum was zero on this dimension

**Extraversion Dimension:** The maximum possible score on this dimension would be 19 and minimum a zero.

**Neuroticism Dimension:** The maximum possible score on this dimension would 25 and minimum a zero.

Lie Scale: The maximum possible score on this scale one could get would be 19 and minimum zero.

The score obtained by the individual on each scale should be added separately and entered and entered at the top of the page 2 of the questionnaire dimension-wise in appropriate box.

Interpretation
The three scales- Extraversion, Introversion, Neuroticism Normal, and Psychoticism are independent of one another. High score on the E-1 scale would show extraversion and low score introversion. Similarly, the high score on N dimension would show neuroticism and low score normality. High score on the P dimension would show Psychoticism.

4.3.4 Hanfmann & Kasanin concept formation test: The concept formation test was devised by Vigotsky and adopted by Hanfmann & Kasanin (1937). The box contains twenty two blocks differing in colour, shape, size and height and under:

I. Colour: white- 4, yellow- 5, orange- 5, green-4, blue-4
II. Surface shape: triangular- 4, quadrilateral- 4, square- 4, hexagonal- 2, circular- 4, semicircular- 4.
III. Surface size: large- 11, small- 11
IV. Height: tall- 10, flat- 12

Thus there are five colours, six shapes, two sizes and two heights. Each block carries one of the four printed names at its bottom, which is a three letter nonsense syllables. The names are log, mur, bik, and cev. Log means large and tall 5 blocks. Mur means small and tall 5 blocks. Bik means large and flat 6 blocks. Cev means small and flat 6 blocks.

Procedure: Blocks were properly mixed before a start. The bottom of all the blocks was downward so that could not see the name of blocks. Subject was not allowed to invert the blocks to see the name printed at the bottom. The order of group was charged for each trial systematically to counter balance the order effect. There was no disturbance when the subject was sorting the blocks.
The subject is comfortably seated in front of the experimenter. Experimenter takes out all the twenty two blocks from the box and keeps them on the table in mixed order in front of the subject. Experimenter is careful to see that the name printed at the bottom of the blocks is not visible to subject. Experimenter keeps the blocks with their bottom down. He rights hand note time and errors on the data sheet.

Subject is told that these twenty two blocks actually are of four different kinds or groups and each group has its name. These names are printed at the bottom of the blocks. Subjects should turn the blocks upside down and see the name.

4.3.5 Global Assessment of Functioning Scale (GAF Scale): DSM-IV Axis V consisted of the Global Assessment of Functioning (GAF) scale, representing the clinician's judgment of the individual's overall level of "functioning on a hypothetical continuum of mental health-illness." GAF Scale was used to assess the pre and post condition of the subject in the process of counselling. It contains supplemental information on relevant medical conditions, psychosocial and environmental problems, and a global assessment of functioning (GAF), respectively. This scale ranges from 100 (excellent functioning, no problems or symptoms) to 1 (extremely impaired functioning).

4.3.6 Ten sessions of counselling were provided to substance abusers for the management of addiction.

4.4 PROCEDURE

For data collection the researcher contacted many psychiatric centres and drugs de-addiction centre in Delhi, Lucknow, Varanasi and Faizabad. First of all, the researcher asked to the subjects to fill case
study sheets. On the basis of information provided regarding duration of taking drugs in case study sheet, the researcher formed groups. After this P.G.I. Memory scale, Eysenck Personality Questionnaire and Hanfmann&Kasanin concept formation test was applied on the subjects. The instructions were given according to manual and questionnaire. The responses were coded and scoring was done according to manual. All the scores were tabulated and their statistical analysis was done.

4.5 STATISTICAL ANALYSIS

**Mean:** The mean of a data set is the average of all the data values. The mean (also known as average), is obtained by dividing the sum of observed values by the number of observations, \( n \). Although data points fall above, below, or on the mean, it can be considered a good estimate for predicting subsequent data points. Graphical presentation of mean is also included with mean tables.

**Standard deviation:** The standard deviation gives an idea of how close the entire set of data is to the average value. Data sets with a small standard deviation have tightly grouped, precise data. Data sets with large standard deviations have data spread out over a wide range of values.

**t-test:** The t-test is a statistical test that is used to determine if there is a significant difference between the mean or average scores of two groups. The t-test essentially does two things: First, it determines if the means are sufficiently different from each other to say that they belong to two distinct groups. This is done by getting the average score of each group, and then getting the difference of the two means. Second, the t-test also takes into account the variability in scores of the two groups. This is called the standard error. The
difference between means, with the standard error taken into account, will give a t-Value.

**Analysis of variance**: Analysis of variance (ANOVA) is a collection of statistical models used in order to analyze the differences between group means and their associated procedures (such as "variation" among and between groups), developed by R. A. Fisher.