CHAPTER II
METHODOLOGY

The spirit of scientific enquiry is to objectively ascertain facts and analyse them in an unbiased manner to draw fruitful conclusions. Scientific methodology was evolved to achieve these objectives and psychology, in accordance with this spirit disowned a long time ago all those methods which, despite providing useful data were intrinsically subjective. The choice of a method is governed by the type of the problem the researcher intends to investigate. Exploratory studies are conducted when the researcher finds that there exists little or vague knowledge about a problem. In such a case it is also difficult to postulate explicit hypotheses. Confirmatory experiments could only be conducted when the researcher has information related to the problem on a host of variables (Elmes, Kantowitz and Roediger, 1985). This together with the development of insight into problems is extremely helpful in explicitly formulating the hypothesis. The exploratory method also helps in the determining the independent variable whereas in the confirmatory experiment we determine the extent to which the independent variable influences the dependent one.

The above mentioned aspects were discussed in detail because they are directly related to our present investigation.
The relationship between noise and menstrual pattern has not been investigated yet. In this regard we have to follow the exploratory method together with relevant information about the influence of noise on menstrual cycle length, menstrual duration and feeling of discomfort. As regards the two other independent variables -- anxiety and depression -- much information is available, so it could conform to the requirements of confirmatory experimentation. When independent variables are properly delineated and their levels categorized it is possible to test the influence of independent variables on the dependent ones. Such experimental designs are known as factorial designs. "Factorial experiments include conditions that represents all possible combinations of all levels of each independent variable" (Elmes, Kantowitz and Roediger 1985). In factorial design the main effects of each independent variable are separately determined. It could also be found out how the variables affect and influence each other. Technically it is known as 'interaction effect'. The present investigation seems appropriately amenable to factorial design.

The review of research literature, reported in the preceding chapter, clearly brings to the fore that noise, anxiety and depression may influence menstrual pattern. It was observed that very few researchers have attempted to relate the influence of noise on menstrual cycle, duration and feeling of discomfort. The foremost concern of the researcher was to ascertain the influence of noise on the above mentioned
menstrual aspects. Thus it was imperative that an experiment be conducted to determine the influence of the independent variable (noise) on the dependent variable (menstrual pattern).

**EXPERIMENT ON NOISE**

An exploratory study was conducted to determine the influence of noise on three aspects of menstrual pattern. For this purpose the resident students of Sarojini Naidu Hall, Aligarh Muslim University, Aligarh, were selected. This Hall of residence is meant for post-graduate, medical and engineering women students. Research scholars also reside there. The main consideration was that the resident members of S.N. Hall being mature would cooperate enthusiastically in the conduct of the investigation.

From the list of bona fide residents of S.N. Hall 30 students were randomly selected. Each of them were individually administered the Menstrual Pattern Schedule (MPS) developed by the investigator. This was done much before conducting the experiment. Each individual's data for cycle length, menstrual duration and feeling of discomfort was obtained. After a lapse of about four months the purpose of the investigation was explained to the subjects regarding their exposure to noise for a period of 30 minutes. The experiment was to be conducted in each subject's room to control such extraneous variables as newness of locale, inadvertent disruption by visitors of the
experimental procedure, etc. In spite of personal rapport and persuasion, only 16 subjects volunteered to participate in the experiment, and completed the experimental procedures. The age of the subjects ranged between 19-24 and the family income ranged between Rs. 2,100 to 3,000 p.m.

The duration of the exposure time may be debatable but ethical considerations influenced our choice regarding duration and intensity of noise. Some of the subjects were initially exposed to a duration of an hour but they protested that they could not bear the long exposure. This led the investigator to reduce the exposure time to 30 minutes. As regards the noise intensity, it was recorded from various places such as railway platform, industrial organisations, etc. The main concern was that high intensity noise was to be recorded. The taped noise was measured in terms of DB, the prescribed unit of noise. The average value of noise power was found to be equivalent to 79 DB.

Each subject's expected date of menstruation was obtained from the persons selected. They were exposed to the noise experiment for 30 minutes, 2-5 days prior to the menstrual period. During the experimentation the subjects were engaged in cancellation of vowels taken from newspapers. Care was taken to ensure that each subject was given a passage of equal length. The MPS was readministered to the same subjects after their menstrual phase. The subjects were also requested to give
informations about their experience of exposure to noise.

It was hypothesised that exposure to noise would influence menstrual pattern. More precisely, it would affect menstrual cycle length, duration and feeling of discomfort during menstruation. The experimental procedure detailed above would reveal that it was a before and after design.

It is quite apparent that noise was considered as an independent variable and the three aspects of menstrual patterns were the dependent ones.

Kolmogrov-Smirnov (K-S) test was used to measure significant differences between the groups. The minimal requirement for K-S two-sample test is an ordinal scaling of measurement and it determines the significant difference between the two independent samples drawn from the same population. "The two-tailed test is sensitive to any kind of difference in the distributions from which the two samples were drawn -- differences in location (central tendency), in dispersion, in skewness, etc." When compared with t-test it has power efficiency of about 96 per cent for small samples. The differences in menstrual pattern scores between before and after exposure to noise were tested and the results obtained are given in tables 1, 2 and 3.

It is clearly perceptible that noise does not influence menstrual cycle length, menstrual duration and feeling of discomfort. It could be inferred that noise cannot be taken
Table 1

NOISE AND MENSTRUAL CYCLE

<table>
<thead>
<tr>
<th>Noise</th>
<th>K-S value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Exposure</td>
<td>1.15</td>
<td>Insignificant</td>
</tr>
</tbody>
</table>

Table 2

NOISE AND MENSTRUAL DURATION

<table>
<thead>
<tr>
<th>Noise</th>
<th>K-S value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Exposure</td>
<td>1.03</td>
<td>Insignificant</td>
</tr>
</tbody>
</table>

Table 3

NOISE AND MENSTRUAL DISCOMFORT

<table>
<thead>
<tr>
<th>Noise</th>
<th>K-S value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Exposure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>After Exposure</td>
<td>2.00</td>
<td>Insignificant</td>
</tr>
</tbody>
</table>
as an independent variable to study menstrual pattern. But a few considerations have to be taken into account before we can pass a categorical judgement. Firstly, the sample size was small. Secondly, the exposure time was short and thirdly we were not in a position to conduct the experiment repeatedly on the subjects who had volunteered to participate. Apart from these methodological aspects we should not ignore the physiological aspects of the mechanism of menstruation. It is reported that ovulation takes place on the 14th day before the onset of next cycle. Thus, the cycle may be influenced by exteroceptive stimulus (noise) on the day mentioned above, though the duration and feeling of discomfort may remain largely unaffected. Thus a complicated and comprehensive experimentation spread over a period of at least six months is required to study the influence of noise on menstrual pattern. The limitations mentioned above did not allow us freedom for continuation of the experimentation.

Review of literature undertaken in the preceding chapter impresses us with the fact that age of the subject and the time/age at which menstruation occurs are the other variables that may influence menstrual cycle, duration and feeling of discomfort. It was observed that the regularity-irregularity (menstruation) syndrome may also influence menstrual pattern. It is proposed to investigate the influence of these variables in conjunction with anxiety and depression. Summarising the variables proposed to be investigated we may delineate them as given below:
**Independent Variables**

Anxiety, depression, age of menarche, age of subject and irregularity of occurrence of menstruation.

**Dependent Variables**

Menstrual cycle length, menstrual duration and feeling of menstrual discomfort.

**Tools Used**

The measuring tools have to be discussed so as to make our choice of research design and statistical analysis. Manifest anxiety of the subjects was measured with the help of a scale developed by Khan and Hasan (1978). As a matter of fact, it is a shorter version of Sinha's Anxiety Scale. It consists of 30 items and the norms have been provided by the authors for female as well as male students. The normative sample was of Aligarh Muslim University, Aligarh. The split-half reliability of this scale was found to be 0.72. The validity of this test was determined by correlating the scores of the subjects on Maslow's Security Insecurity Inventory (1952) and Cattell's Scale of Ergic Tension included in his 16 PF Questionnaire (1965). The correlation coefficients of the shorter Scale with Maslow's S-I Inventory and Cattell's Scale of Tension were 0.535 and 0.531 respectively (Khan and Hasan, 1978).

Depression was measured with the help of Murthy's D-Scale. It is one of the nine scales of Multiphasic Questionnaire
developed by Murthy (1965) which measures the depression. The D-Scale consists of 14 items. The split half reliability of this scale was 0.70.

The three aspects of menstrual pattern (the cycle length, menstrual duration and feeling of menstrual discomfort) were measured with the help of Menstrual Pattern Schedule (MPS) developed by the investigator (Khatoon, 1986) (Appendix I). The procedure adopted to develop the Schedule as a valid and reliable measure has been extensively discussed.

SAMPLE

Muslim University, Aligarh, is one of the oldest residential universities of the country. The bona fide students are allotted to various Halls of Residence. Sarojini Naidu Hall (S.N.) and Abdullah Hall (A.H.) are exclusively meant for the women students of the University. Postgraduate (Law, Teacher Trainees, Library Science, etc.) Research Scholars, Engineering and Medical and such other students enrolled for professional courses reside in S.N. Hall whereas all the undergraduate students are the members of Abdullah Hall. Also post-graduates of Arts, Science and Commerce are admitted to Abdullah Hall.

A complete list of students of each Hall was obtained from the Provost Offices. Every fourth individual was randomly selected. In case of non-availability of a particular individual, the next one on the list was included. The sample
comprised of 75 (N = 300) students of S.N. Hall, and 200 (N = 800) students of Abdullah Hall.

Table 4 given below represents the essential features of the sample.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of subjects</td>
<td>17-25</td>
<td>21.26</td>
</tr>
<tr>
<td>Parental income</td>
<td>Rs. 600-4,000</td>
<td>2,312</td>
</tr>
<tr>
<td>Educational level (Parental)</td>
<td>High School</td>
<td>Ph.D.</td>
</tr>
</tbody>
</table>

It may be observed that the age of the subjects ranges between 17-25 years with a mean of 21.26. The subjects are post-adolescents and young adults. The income range is widespread, but, the mean = 2,312 which is indicative of the fact that the majority comes from upper middle income group. The parental educational level of the sample ranges between High School to Ph.D.

DATA COLLECTION

The collection of data was divided into various phases because of the nature of the investigation. Few people give frank responses to personal questions and specially to the aspects which are considered to be social taboos. It is an
undeniable fact that in our society people would not like to talk about sex. Similarly, information about menstruation had to be obtained in strict confidence. This required special measures to win over the subjects, develop mutual confidence and motivate them to elicit precise information. These considerations led us to decide to first of all collect data on menstrual pattern with the help of MPS.

Preliminary contact was established with a few enlightened subjects and the aims and objectives of the study regarding information about menstruation was explained to them. They were assured that their identities would not be revealed to anyone and their responses would be treated in strict confidence. Initially we discussed the problem of menstruation. Many subjects sought information from the investigator about certain aspects of menstruations. Having won the confidence of the group, the investigator individually approached the randomly selected subjects. The names of those were deleted who were not found very willing to participate in the investigation. The next individual was approached and the same procedure was adopted for each subject.

Having established rapport, prior appointment with each subject was sought and time, date and place were fixed. The MPS was untimed and since many clarifications regarding terminology used were solicited by the subjects long, often repeated sittings were required for each administration. Care
was taken that except for the investigator no one was present in the room during data collection. Undoubtedly it was a time consuming process but it was adhered to to ensure the reliability of data.

Then anxiety and depression scales were administered to the same subjects in more or less the same manner. The responses were tabulated on a master sheet and tables were made separately for analysis in accordance with requirements of various statistical tests.

The next phase pertained to the determination of influence of noise on menstrual pattern. We have already reported the experiment.

**EXPERIMENTAL DESIGN**

As stated earlier, we had four independent and three dependent variables to manipulate to achieve the objectives of the study. In such cases usually multivariate analysis are considered most appropriate. The investigator faced two important difficulties. Firstly, the determination of composite scores of each individual for menstrual cycle, duration and discomfort. Secondly, the computational hazards of operating all the variables together. Most precisely, the non-availability of computer programme for the multivariate analysis posed the greatest impediment for such an analysis. These led to the decision to use univariate analysis
where the influence of a group of independent variables could be studied on each aspect of menstrual pattern.

McGuigan (1969) states that "one possible design for studying two or more independent variables in a single experiment is the factorial design. A complete factorial design is one where all possible combinations of the selected values of each of the independent variables are used".

Each independent variable was dichotomised and 2 x 2 design and 2 x 2 x 2 designs was used. Analysis of variance was used for determining the significant differences and where the results were found to be significant t-test was used.

The simplest application of F-test indicates an estimate of error variance plus an estimate of the real effect (if any) of the independent variable (McGuigan, 1969). In order to determine the F-ratio the independent variables were dichotomised. F-ratio for each aspect of menstrual pattern was separately determined. t-test, a powerful parametric test, was used to analyse the significant differences between the means. It is a useful statistical test when small groups having similar variability are to be compared (Tate, 1956).

The first F-test pertained to the determination of influence of Anxiety (A), Depression (B) and interaction (AxB) effect of the independent variables on each aspect of the menstrual patterns. This constituted the 2 x 2 design. In case of 2 x 2 x 2 designs, three independent variables were
similarly treated. Broad hypotheses were framed and tested as given below:

(1) Anxiety and Depression would influence menstrual cycle length, duration and feeling of discomfort.

(2) The interaction of the independent variables would significantly influence each of the dependent variables.

(3) Anxiety, depression and age of menarche would influence menstrual cycle length, duration and feeling of discomfort.

(4) The interaction of the independent variables would significantly influence each of the dependent variables.

(5) Anxiety, depression and age of the subject would influence menstrual cycle length, duration and feeling of discomfort.

(6) The interaction of the independent variables would significantly influence each of the dependent variables.

(7) Anxiety, depression and irregularity would influence menstrual cycle length, duration and feeling of discomfort.

(8) The interaction of the independent variables would significantly influence each of the dependent variables.