CHAPTER FIVE

INVESTIGATION PROCEDURE FOLLOWED IN CONDUCTING
THE PRESENT INVESTIGATION

5.1. Selection of Venue

After surveying different manufacturing concerns in and around Dhaka city of Bangladesh it was observed that shiftwork schedule remained in existence since the very onset of both jute and cotton industries. Of these two types cotton mills were found suitable in conducting the present investigation - as they remained free of labour troubles and other obvious interruptions. Authorities of the 4 cotton Mills, who were found to have a history running their establishments more than a decade, were approached by the investigator to get formal permission in conducting the present investigation after the outline plan and method explained earlier and availing of necessary facilities within the campus of the Mills. Of these 4 Mills, only the authorities of M/S Chitta Ranjan Cotton Mills Ltd. showed encouraging gestures and communicated their willingness to the investigator in allowing the workers of both morning and night shifts to take part in the investigation as sample and offering other facilities to make this effort a success (copy of permission in Appendix One). Accordingly, it was decided to select finally the said Cotton Mills, incidentally available, as the venue of the present investigation.

A short description of the selected venue:

The Chittaranjan Cotton Mills Ltd. is located at Narayanganj - near Dhaka city. It was established in the year 1929 under the British regime and the commercial production of the Mills was started on November, 1930. Since
Both the probationers and the casual workers being placed in a particular shift schedule earns monthly salary while the permanent workers enjoys wages as per piece-rate system, except the nightshift workers who enjoys the privilege of earning Rs.3/- more per nightshift after Bangladesh currency.

The manufacturing of products is carried through the four divisions of work, viz., spinning the raw cottons in Spinning Mill, then weaving the cloth as per design in weaving Mill, then dyeing the woven cloth as per requirement, and lastly packaging the goods for marketing.

5.2. Selection of Sample:

Sample of the present investigation was selected from the population of shift workers in the Mills concerned working permanently either in day or in night shifts - excluding the workers of B shift who works daily from 10 A.M. to 2 P.M., following a break of four hours, again from 6 P.M. to 10 P.M. From the office of the Mills concerned the lists of males permanent workers in the day and night shifts were collected. Out of these two lists of names, 200 names of male, permanent workers were selected from each list. Thus by random selection method altogether 400 names of males permanent workers from both shifts were selected.

Following which, with the help of the office, the service records of these 400 permanent male shift workers were carefully scrutinised to form a
single-group with those male, permanent workers, well-matched in terms of the following criteria:

1) Age: Within the range of 35-45 years.
2) Education level: Junior school level.
3) On the job experience: 10-15 years.
4) Religious and cultural backgrounds: Muslim and Islamic culture.
5) Marital status: Married with small family.
6) Citizenship: Permanent citizen of Bangladesh.

Thus a list of names of 360 workers were made available to form a single-group well matched in terms of above criteria. The said list of names were then alphabetically arranged to select, after random numbers, 200 workers only - 100 from each of the two shifts - with 'age-mean' 39.07 years and 'on the job experience mean' 12.01 years.

In brief each workers in the said representative sample pool (N=200) became describable as:

Description: Permanent citizen of Bangladesh, Muslim, follows Islamic culture, traditions, and community life, male, within age-range 35-45 years, read up to junior school level, married with small family, permanently working in the establishment for a period range 10-15 years (either in the day or nightshift).

These individuals were then placed under two groups in terms of the criteria of their respective placement in the shift Schedule to form a group of 100 dayshift workers and 100 nightshift workers.
5.3. Short Description of the Instruments Used:

A set of six standardised Tests were used to collect data from each of the above representative sample. Short description of each of those Tests are given below:

(1) Yoshitake's Symptom of Fatigue Scale (1971):

This Test has been developed by Yoshitake under the auspices of the Industrial Fatigue Research Committee of the Japanese Association of Industrial Health, consisting of 25 valid items helpful for identifying the felt-symptoms of fatigue related to work of an individual worker. The reliability and validity have been studied and reported by several researchers of the JAIIH (Kogi et al, 1970; Saite et al, 1970; Yoshitake, 1971).

A Bengali version of this Test was developed and adapted with local sample by Khaleque & Rahman (1982) with reliability coefficient (.75) and validity coefficient (.52). A copy of this locally adapted Bengali version of the Test has been displayed in the Appendix A.

(2) Borg's Ratings of Perceived Efforts Scale (1972):

This scale was developed by Borg in 1962 and standardised by several studies upto 1973 for the identification of a reported intensity of effort that a particular worker feels he/she regularly invests to perform his/her job in terms of perceiving the performance in a dimension of "hard-easy". It consists of a 7-point scale fitted against fifteen every alternate equidistant perceivable 'just noticeable difference' points ranging from
6 to 20 - wherein the starting point 7 signifies the statement "very very light" and the ending point 19 signifies the statement "very very hard", along a graded points arranged from lower to higher in order. By several intensive studies the reliability and validity of this Test have been verified (Borg, 1973; Skinner et al, 1973). A significantly high positive correlation between high score of this scale and faster heart beats have been reported by different investigators (Morgan, 1973, Stanford, 1976; Kinsman & Weiser, 1976; Ulmer et al, 1977).

The Bengali version of the Test has been adapted with local sample by Khaleque (1984) with high test-retest reliability (.31) and validity in terms of 'high score-faster heart beat' correlations (.65), as observed by others. A copy of the said Bengali version of Test, used here, has been displayed in Appendix B.

(3) Dirken's Inventory for Subjective Health (1966):

This questionnaire with 58 enquiry items of subjective perception of one's feeling of physical health and physical sense of well-being, set against Yes/No response type information, have been standardised by Dirken on 2500 workers from several industries with high internal consistency coefficient (0.91) in the data from a group of 1782 manual workers. 48 of these questions are used to compute a score for positive feeling for impaired health while the other 10 questions are meant for safeguarding the mental set and involvement of the respondent while doing with the questionnaire - as a check against
irrelevant answers. Wilde (1963) checked its validity with rate of absenteeism and medical diagnosis for psychosomatic disorders.

The Bengali version of the Questionnaire has been adapted with local sample by Khaleque & Rahman (1983) with high internal consistency coefficient (.69) and validity measures with rate of absenteeism (.48). A copy of the said Bengali version of the Questionnaire, used here, has been displayed in Appendix C.

(4) Goldberg’s General Mental Health Questionnaire (1972):

This is a 60-item Questionnaire and designed as a self-administered mental health screening test—where item Nos. 12, 20, and 30 consider the reaction time of responding. Each question is meant for collecting information about the respondent’s recent experience about a particular mental health problem being rated on a 4-point scale to indicate the gravity. The development studies of this Questionnaire reported by Goldberg (1978) have provided evidences of high internal consistency, test-retest reliability, and validity in terms of a good linear relationship with clinical check-up records, as the criteria ($r = 0.70$).

The Bengali version of the Questionnaire, used here, has been locally adapted by Khaleque and Siddique (1984) with high internal consistency (.65) and test-retest reliability (.73). A copy of the said Bengali version has been appended under Appendix D. 
(5) **Bravfield-Rothe Job-satisfaction Scale (1951):**

This is a 18-item much used and standardised questionnaire to appraise the nature of job-satisfaction fitted with a Likert-type 5-point equidistant scale along Agreement-disagreement dimension, with a score range of 18-90 where high score indicates high job satisfaction and the reverse (when the score 54 speaks of the matter 'undecided').

The Bengali version of this Questionnaire adapted with local sample by Khaleque (1984) with reliability co-efficient (.66) and high validity (.63), used in the present investigation, has been appended in Appendix S.

(6) **Wedderburn's Job-related Problems Inventory (1978):**

This Questionnaire was adapted from Wedderburn Inventory (Wedderburn, 1978). It was used to assess the workers' attitudes towards some specific aspects of different types of shift work, health complaints, sleep difficulties and perception of family life and social life in shift work, vis-a-vis their own particular schedule. A copy of the locally adapted Bengali Version (Khaleque, 1984) of this Questionnaire was used in this study, has been appended in Appendix P.

The names of 82 willing workers from the morning shift and 85 willing workers from the evening shift schedules were separately arranged alphabetically and serialised. The date, hours, and venue were made informed to the workers concerned through respective shift supervisors, after a schedule for data collection developed by the investigator (Table 2). The schedule
**TAB 2**: Schedule Developed for Data Collection (Applicable for both shifts)

<table>
<thead>
<tr>
<th>Day</th>
<th>Batch No.</th>
<th>Serial Nos. in the Batch</th>
<th>Test Nos. Alotted</th>
<th>Duration of Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
<td>First</td>
<td>1, 11, 21, 31, 41, 51</td>
<td>T₁, T₂, T₄</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Second</td>
<td>61, 71, 81, 2, 22, 31</td>
<td>T₃, T₅, T₆</td>
<td></td>
</tr>
<tr>
<td>2nd</td>
<td>Third</td>
<td>3, 42, 52, 62, 72, 82</td>
<td>T₄, T₂, T₁</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Fourth</td>
<td>13, 23, 33, 43, 53, 63</td>
<td>T₆, T₅, T₃</td>
<td></td>
</tr>
<tr>
<td>3rd</td>
<td>Fifth</td>
<td>4, 14, 24, 34, 44, 54</td>
<td>T₂, T₁, T₄</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Sixth</td>
<td>5, 64, 74, 15, 25, 35</td>
<td>T₅, T₃, T₆</td>
<td></td>
</tr>
<tr>
<td>4th</td>
<td>Seventh</td>
<td>6, 16, 45, 55, 65, 75</td>
<td>T₂, T₁, T₄</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Eighth</td>
<td>26, 36, 46, 56, 66, 76</td>
<td>T₅, T₃, T₆</td>
<td></td>
</tr>
<tr>
<td>5th</td>
<td>Ninth</td>
<td>7, 17, 27, 37, 47, 57</td>
<td>T₁, T₂, T₄</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Tenth</td>
<td>8, 18, 28, 38, 67, 77</td>
<td>T₃, T₅, T₆</td>
<td></td>
</tr>
<tr>
<td>6th</td>
<td>Eleventh</td>
<td>9, 19, 48, 58, 68, 78</td>
<td>T₄, T₂, T₁</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Twelveth</td>
<td>29, 39, 49, 59, 69, 79</td>
<td>T₆, T₅, T₃</td>
<td></td>
</tr>
<tr>
<td>7th</td>
<td>Thirteenth</td>
<td>10, 20, 30, 40, 50, 60</td>
<td>T₂, T₄, T₁</td>
<td>2 HRS</td>
</tr>
<tr>
<td></td>
<td>Fourteenth</td>
<td>70, 80, 83, 84, 85</td>
<td>T₃, T₅, T₆</td>
<td></td>
</tr>
</tbody>
</table>

N.B. After 7th day of Testing i.e. from 8th day simply the workers were transferred from one batch to the other of the 1st to 7th days while the Test Nos. were kept unaltered to provide the workers opportunities to do with all the six tests within 8th to 14th days.
was developed in a manner so that the workers included in a batch in a par­
ticular were to report to the investigator simply two hours earlier than their
reporting to duty on that data — so that the data collection in no way could
affect their duty and normal piece-rate production efficiency.

In a Test session for 2 hours the workers of two batches \((6 + 6 = 12)\)
were accommodated in two different apartments and to each of them the
3 allotted Tests were administered one by one, with the assistance of
trained helpers. In each apartment the investigator herself explained each
test to six workers at a time (where necessary by replying individual queries)
and a trained assistance was allotted to act as observer to control the adminis­
tration and for maintaining direct and prompt communication with the Investi­
gator to run the session uninterrupted. Thus, in a day 12 workers were
tested within two hours of time for a set of three tests and the schedule was
continued for seven days and then changed for another seven days, as indicated
below Table 2. By following the above procedure data for six selected tests
were collected from all the workers of dayshift first within a period of three
weeks. Following the same procedure data were collected from the workers of
nightshift within another six weeks.

5 workers of dayshift and 4 workers of nightshift could not attend the
test session due to unavoidable personal difficulties under due intimation
and on scrutiny data given by 2 workers of morning shift and 3 workers of
night shift were found incomplete and taken out from the data pool. Thus,
finally 75 sets of data for morning shift workers and 75 sets of data for
evening shift workers were tabulated for necessary treatment required for
interpretation of results.
The following procedure was followed for processing data in presenting the Results of the investigation being followed by necessary statistical treatment for the interpretation of results in the following chapter (chapter Six):

Step 1: Two sets of data, for dayshift workers (N=75) and nightshift workers (N=75), collected by the investigator by administering the adapted Bengali version of Yoshitake's Symptoms of Fatigue Scale (Khaleque & Rahman, 1982) were tabulated separately to show the nature of score distributions and for the calculation of Mean and standard deviations (Table 6.1, Figure 1, Table 6.2, Figure 2). A short qualitative interpretation of the above distributions of score were also incorporated below respective the Tables. Two sets of Means were then compared with the help of \textit{t} test in order to comment on the first research question, stated earlier (4.2i). Result of the \textit{t} test was tabulated also (Table 6i).

Step 2: Two sets of data for dayshift workers (N=75) and night shift workers (N=76), collected by the investigator by administering the adapted Bengali version of Borg's Ratings of perceived efforts scale (Khaleque, 1984) were tabulated separately to show the nature of score distributions and for the calculation of Mean and standard deviations (Table 6.3, Figure 3, Table 6.4, Figure 4). A short qualitative interpretation of the above distributions of scores were also incorporated below respective tables. Two sets of Means were then compared with the help of \textit{t} test in order to comment on the second research question, stated earlier (4.2ii). Result of the \textit{t} test was tabulated also (Table 6ii).
Step 3: Two sets of data, for dayshift workers (N=75) and night shift workers (N=75) collected by the investigator by administering the adapted Bengali version of Dirken's Inventory for Subjective Health Questionnaire (Khaleque & Rahman, 1983) were tabulated separately to show the nature of score distributions and for the calculation of Mean and standard deviations (Table 6.5, Figure 5, Table 6.6, Figure 6). A short qualitative interpretation of the above distributions of score were also incorporated below respective tables 5 & 6. Two sets of mean were then compared with the help of 't' test in order to comment on the third research question, stated earlier (4.2iii). Result of 't' test was tabulated also (Table 6iii).

Step 4: Two sets of data, for dayshift workers (N=75) and night shift workers (N=75) collected by the investigator by administering the adapted Bengali version of Goldberg's General Mental Health Questionnaire (Khaleque and Siddique 1984) were tabulated separately to show the nature of score distributions and for the calculation of Mean and standard deviations (Table 6.7, Figure 7, Table 6.8, Figure 8). A short qualitative interpretation of the above distributions of score were also incorporated below respective Tables. Two sets of Means were then compared with the help of 't' test in order to comment on the fourth research question, stated earlier (4.2iv). Result of 't' test was tabulated also (Table 6iv).

Step 5: Two sets of data for dayshift workers (N=75) and night shift workers (N=75) collected by the investigator by administering the adapted
Bengali Version of Brayfield - Rothe Job-satisfaction Scale (Khaleque 1984) were tabulated separately to show the nature of score distributions and for the calculation of Mean and standard deviations (Table 6.9, Figure 9, Table 6.10, Figure 10). A short qualitative interpretation of the above distributions of score were also incorporated below respective Tables. Two sets of Means were then compared with the help of 't' test in order to comment on the fifth research question, stated earlier (4.2v). Result of 't' test was tabulated also (Table 6v).

Step 6: Percentages of 'Yes' responses of the permanent day and night shift workers on some specific problems of shift work, collected by the investigator by administering the adapted Bengali version of Wedderburn's Job-related Problems Inventory (Khaleque, 1984), were tabulated (Table 6.11, Figure 11). A short qualitative interpretation of the above table was also incorporated below the respective Table to comment on the sixth research question, stated earlier (4.2vi).

5.4. Summary and Concluding Comments

On the basis of the interpretation of results an attempt was made finally to present an overall discussion leading to concluding comments (Chapter Seven). Summary of the present investigation was given in Chapter Eight. At this stage, a final scrutiny had been done regarding reference works to be presented along with supportive Appendices required to structure the dissertation properly.

5.5. Writing the Dissertation

Finally, this work was taken up to present overall idea of what had been done so far in completing the investigation - keeping in view of the aim and objectives of the entitled present investigation (4.2).