To carry out any research investigation, it is necessary to adopt a systematic method and procedure. By methodology of any research we mean the selection of the representative sample from out of general population, applying appropriate research tools and techniques, collecting relevant data, analysis and interpretation of the same for scientific investigation of the problem.

In the words of Best (1963) “research is considered to be more formal, systematic, intensive process of carrying of the scientific method of analysis.” It involves a more systematic structure of investigation, usually resulting in some sort of formal record of procedure and a report of results or conclusions.

Research is neither reading nor writing a textbook & not even haphazard looking for facts. It is, essentially a systematic inquiry seeking facts through objective methods in order to discover the relationships among the variables and adduce from them broad principles or laws.

3.1 DESIGN OF THE STUDY

Having reviewed the related literature and researches on different dimensions of Job stress, Anxiety, Blood Pressure, Hypertension, Heart-rate, and Relaxation techniques the investigator proceeds to formulate the plan and design which follows in the subsequent chapter.
METHOD AND PROCEDURES

Design is the process of making decision before a situation arises, in which the decision has to be carried out. It is a process of deliberate anticipation directed towards bringing unexpected situation under control (Ackoff, 1953).

The present study “The Effect of Relaxation Techniques on Job stress in relation to Blood Pressure, Hypertension and Heart-rate in women teachers” can be described as Experimental Randomized Controlled Trials Concurrent Parallel study design (Park, 2000).

It is experimental in the sense that it is under the direct control of the investigator. Thus experimental studies involve some action, intervention or manipulation such as deliberate application or withdrawal of the suspected cause or changing one variable in the causative chain in the experimental group while making no change in the control group, and observing and comparing the outcome of the experiment in both the groups.

It is randomized controlled trials for it involves a process of random allocation. The schematic diagram of randomized controlled trials is shown in fig 3.1.

It is concurrent parallel study design for comparisons are made between two randomly assigned groups, one group exposed to specific treatment i.e experimental group, and the other group not exposed i.e control group. The sample population remains in the study group or the control group for the duration of the investigation. The schematic diagram of concurrent parallel study design is shown in Fig 3.2.

The present research project entitled “The Effect of Relaxation Techniques on Job stress in relation to Blood Pressure, Hypertension and Heart-rate in women teachers” is experimental in nature. It is designed to explore the effectiveness of relaxation techniques in reducing job stress, anxiety blood pressure and heart-rate level of employed women teachers.
Fig: 3.1. – Design of a randomized controlled trials as given by Park, 2000
3.2. SAMPLE

In every research project it is not only difficult but impossible to include the whole population. Thus the researcher tries his/her best to select such a sample which is representative of the whole population to be studied.

Khanna. et al (1992) states, “no botanist or zoologist has examined every plant or animal of a particular species, nor has any child psychologist examined every human child”. Further William (in Khanna. et al 1992) points out “In every branch of science we lack the resources to study more than a fragment of the phenomena that might advance our knowledge”.

In the field of education during recent years sampling has been increasingly used in education to ascertain information necessary in answering certain questions about a specific population because sampling reduces cost, brings speed, increases scope and gives greater accuracy.
METHOD AND PROCEDURES

“The term sample should be reserved for set of unit or portion of a aggregate and material which has been selected in the belief that it will be representative of the whole aggregate” (Yates, 1949).

With this end in view, the sample was selected by following a two-stage randomization and stratification of the parent population of high and higher secondary school teachers of Chandigarh.

To attain this aim the investigator first procured list of all 124 schools of Chandigarh. In the first stage of stratification the schools were sub grouped according to the kind of management i.e. Government or Private. There were 79 Private schools and 45 Government schools. The researcher considered only 1/3rd schools as true representative from each of the sub-groups by the method of draw of the lots. So there were 27 Private schools picked up from the total of 79 schools. While there were 15 Government schools as sample schools of the total of 45 Schools of these 42 schools (27 Private and 15 Government) only 30 schools (15 Private and 15 Government) wished or showed interest in participation in research work. Pilot population of 300 teachers was drawn from these 30 schools. In the second stage of stratification, schools were classified based on the type of school i.e. whether they were high or higher secondary school. In this process of stratification schools were divided into homogeneous sub groups. Stratification overcomes the drawbacks of biased sampling.

At the end of two-stage stratification there were four groups of schools formed based on the type of management and type of school namely:
1. Government High School
2. Government Higher Secondary School
3. Private High School
4. Private Higher Secondary School

There of 75 teachers were in each of the four groups. The populations of 300 teachers were administered test on stress i.e. the “Faculty Stress Index” to measure their initial level of stress. This test was used as a screening test to identify teachers, which comprised sample.
METHOD AND PROCEDURES

To reduce any risk factor (i.e. any transfer of teacher, retirement, leaving of school by the teacher) the sample size was increased from 100 to 120 teachers. That means from each group 30 teachers were drawn. These 30 teachers were those who scored highest on, FSI i.e. Faculty Stress Index in their respective group. Experimental and Control group teachers were matched on the basis of their FSI scores. Hence at the end, there were eight sub-groups formed:

1. Government High Experimental
2. Government High Control
3. Private High Experimental
4. Private High Control
5. Government Higher Secondary Experimental
6. Government Higher Secondary Control
7. Private Higher Secondary Experimental
8. Private Higher Secondary Control

However, the investigator could come in contact with only 114 teachers as 6 of the teachers had left their school. Sample teachers comprised of 59 Control group teachers and 55 Experimental group teachers. Matched scores of Experimental and Control group are shown in Table 3.1.

Table 3.1. – Showing matched scores of Experimental and Control groups.

<table>
<thead>
<tr>
<th>S. No</th>
<th>Experimental Group Scores</th>
<th>Control Group Scores</th>
<th>S. No</th>
<th>Experimental Group Scores</th>
<th>Control Group Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>176</td>
<td>174</td>
<td>31</td>
<td>92</td>
<td>87</td>
</tr>
<tr>
<td>2</td>
<td>159</td>
<td>169</td>
<td>32</td>
<td>91</td>
<td>63</td>
</tr>
<tr>
<td>3</td>
<td>156</td>
<td>155</td>
<td>33</td>
<td>91</td>
<td>68</td>
</tr>
<tr>
<td>4</td>
<td>147</td>
<td>148</td>
<td>34</td>
<td>88</td>
<td>89</td>
</tr>
<tr>
<td>5</td>
<td>142</td>
<td>140</td>
<td>35</td>
<td>88</td>
<td>89</td>
</tr>
<tr>
<td>6</td>
<td>139</td>
<td>138</td>
<td>36</td>
<td>88</td>
<td>88</td>
</tr>
<tr>
<td>7</td>
<td>138</td>
<td>136</td>
<td>37</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>8</td>
<td>138</td>
<td>135</td>
<td>38</td>
<td>86</td>
<td>86</td>
</tr>
<tr>
<td>9</td>
<td>138</td>
<td>131</td>
<td>39</td>
<td>83</td>
<td>84</td>
</tr>
<tr>
<td>10</td>
<td>133</td>
<td>131</td>
<td>40</td>
<td>83</td>
<td>82</td>
</tr>
<tr>
<td>11</td>
<td>127</td>
<td>124</td>
<td>41</td>
<td>80</td>
<td>81</td>
</tr>
<tr>
<td>12</td>
<td>125</td>
<td>122</td>
<td>42</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>
METHOD AND PROCEDURES

The number of teachers in each sub-group is shown in Table 3.2.

<table>
<thead>
<tr>
<th>Group</th>
<th>Control</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government High (10th)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Government Higher (12th)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Private High (10th)</td>
<td>15</td>
<td>12</td>
</tr>
<tr>
<td>Private Higher (12th)</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>59</td>
<td>55</td>
</tr>
</tbody>
</table>

Table 3.2 showing number of teachers in each sub-group.

OUTLINE OF EXPERIMENTAL STUDY

The present study “The Effect of Relaxation Techniques on Job stress in relation to Blood pressure, Hypertension and Heart-rate in women
teachers’ can be described as Experimental Randomized, Controlled Trials Concurrent Parallel study design.

The sample teachers were drawn from 20 different schools of Chandigarh. The names of the schools, time period and duration in each school are given in the Table 3.3

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of School</th>
<th>Period</th>
<th>Duration</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>St. Anne’s Convent. Sector 32 - D</td>
<td>March – May (2001)</td>
<td>2 Months</td>
<td>8.30 A.M. to 10.30 A.M</td>
</tr>
<tr>
<td>2</td>
<td>Dev Samaj Sr. Sec., Sector 21</td>
<td>March-May (2001)</td>
<td>2 Months</td>
<td>9.00 A.M. to 11.00 A.M</td>
</tr>
<tr>
<td>3</td>
<td>Government Sr. Sec. School 20 - D</td>
<td>March-May (2001)</td>
<td>2 Months</td>
<td>11.00 A.M. to 1.00 P.M</td>
</tr>
<tr>
<td>4</td>
<td>Guru Nanak Khalsa. Sr. Sec. Sector 30 - B</td>
<td>March – May (2001)</td>
<td>2 Months</td>
<td>11.00 A.M. to 1.00 P.M</td>
</tr>
<tr>
<td>5</td>
<td>Shivalik Public School, Sector 41</td>
<td>July – Sept. (2001)</td>
<td>2 Months</td>
<td>9.00 A.M. to 11.15 A.M</td>
</tr>
<tr>
<td>6</td>
<td>Sanjay Public School, Sector 41 C</td>
<td>July – Sept. (2001)</td>
<td>2 Months</td>
<td>1.00 P.M. to 3.00 P.M</td>
</tr>
<tr>
<td>7</td>
<td>Government Model Sr. Sec., Sector 37 - B</td>
<td>July – Sept. (2001)</td>
<td>2 Months</td>
<td>9.00 A.M. to 12.00 P.M</td>
</tr>
<tr>
<td>11</td>
<td>Shivalik Niketan, Sector 22</td>
<td>Aug – Oct (2001)</td>
<td>2 Months</td>
<td>9.00 A.M. to 12.00 P.M</td>
</tr>
<tr>
<td>12</td>
<td>Government High School, Sector 41 - A</td>
<td>Aug – Oct (2001)</td>
<td>2 Months</td>
<td>10.00 A.M. to 12.00 P.M</td>
</tr>
<tr>
<td>13</td>
<td>Government High School, Sector 22</td>
<td>Sept - Nov (2001)</td>
<td>2 Months</td>
<td>8.00 A.M. to 9.00 A.M</td>
</tr>
</tbody>
</table>
TABLE 3.3 - Showing the names of the school, time period & duration in each school

These 114 teachers were administered test on anxiety to measure their initial level of anxiety. Anxiety test was administered as measure of stress level of teachers. Sample teachers comprised of 59 control group teachers and 55 experimental group teachers. The experimental group was given treatment for two months. Experimental group were administered various relaxation techniques in the sequence as shown in Table 3.4.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Name of Exercise</th>
<th>Time Duration (in min.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Physical exercises</td>
<td>10 – 15</td>
</tr>
<tr>
<td></td>
<td>(Warm-ups, Stretch-ups, Twists, Tilts and Press-ups)</td>
<td></td>
</tr>
<tr>
<td>II</td>
<td>Breathing exercises</td>
<td>5 – 10</td>
</tr>
<tr>
<td></td>
<td>(Single-nostril breathing, Alternate nostril-breathing and Breath holding)</td>
<td></td>
</tr>
<tr>
<td>III</td>
<td>Relaxation exercises</td>
<td>10 – 15</td>
</tr>
<tr>
<td></td>
<td>(Autogenic Training)</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Mental exercises</td>
<td>5 – 10</td>
</tr>
<tr>
<td></td>
<td>(Meditation and Mental Imagery)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>30 – 50</td>
</tr>
</tbody>
</table>

TABLE 3.4 - shows various groups of exercises, with the time duration used by investigator on experimental group.
METHOD AND PROCEDURES

These exercises are discussed in detail later in this chapter under the head “Tools and Techniques”, as “Relaxation Techniques” while control group were given no treatment. The subjects in both groups were visited weekly by the investigator to note any change in the blood – pressure and heart-rate level of the teachers concerned. At the end of two months the tests on stress and anxiety (post-test) were again administered to the teachers to observe the reduction of stress level in the employed women teacher.

Epitome of the research process is:

PHASE I
Tests were administered to measure the subjects’ initial level of stress and anxiety. They formed the pre-test. The tests are:
1. Faculty Stress Index by Gmelch, Lovrich and Wilke, 1986.
2. IPAT Anxiety scale by Samuel and Cattel, 1976.

PHASE II
Relaxation Techniques:
They were meant only for experimental group. It is briefly described here, while in latter part of chapter they are dealt in detail. Relaxation techniques basically consist of four major components viz:
1. Physical exercises: Various warm-ups, stretch-ups, twists, tilts and press-up formed part of this group of exercise. They require 10 – 15 minutes to complete.
2. Breathing exercises: Single-nostril breathing, Alternate-nostril breathing and breath-holding. They took 5 – 10 minutes to complete.
3. Relaxation exercises: Autogenic training, which lasted for 10 – 15 minutes.
4. Mental exercises: Meditation and Mental Imagery composed this group of exercises and took 5 – 10 minutes.

Hence the whole relaxation regime took 30 to 50 minutes to complete, according to the physical and mental ability of the teachers.
PHASE III

After an interval of two months, tests on stress and anxiety were again administered (post-test) on both groups, to descry any change in the stress and anxiety levels of teachers.

Schematic representation of the experimental study is given in Fig. 3.3.

Fig 3.3. Schematic representation of the experimental study.
3.4. TOOLS AND TECHNIQUES

For the collection of data it is necessary to adopt a systematic procedure. For every research type there is need to certain instruments to explore new fields. The instruments that are employed to gather new facts or to explore new fields are called 'tools' and the manner in which procedure is executed is called 'technique'. It is of vital importance to select suitable instruments or tools. Different tools are suitable for collecting different types of data. The use of a particular research tool depends upon the type of research proposal. The researcher may use one or more of the tools in combination for this purpose.

In this study the following tools and techniques were used by the investigator to collect data -

1. Faculty stress index (FSI) by Gmelch, Lovrich & Wilke, 1986
2. IPAT Anxiety scale by Samuel and Cattel, 1976.
3. Sphygmomanometer
4. Stethoscope
5. Relaxation Techniques

3.4.1. DESCRIPTION OF TOOLS

A. DEMOGRAPHIC DATA SHEET

The Demographic sheet was developed by investigator to collect personal information about the respondents. Which included information like-respondents name, age, total number of years in teaching, salary status, number of years in current post of responsibility, schools name, type (high, higher secondary) schools management (Government / Private), Appropriate number of pupil in school, Teaching staff, number of pupils in class. It was made of part of FSI.

B. TESTS

Only standardized tests were employed by the investigator.
METHOD AND PROCEDURES

I. FACULTY STRESS INDEX (FSI)

It is a questionnaire developed by Gmelch, Lovrich and Wilke (1984). “The word questionnaire refers to a device for securing answers to questions by using a form which the respondent fills in himself” Good and Hatt (1956).

Barr, Davis & Johnson (1972) defines questionnaire as a “systematic compilation of questions that are subject to sampling of population from which information is desired”.

FSI is a standardized test. It comprises of 48 questions and identifies 45 common sources of faculty stress. In order to ensure that all potentially relevant facets of faculty related stress were identified, the items of FSI were compiled from several sources. A national study of more than 1,200 college and university faculty members was conducted in 100 institutions of higher education (Gmelch, Lovrich, and Wilke 1984). The compilation of items from all these sources resulted in 45 item Faculty Stress Index (FSI). Factor analysis of the 45 items indicates the presence of five distinct clusters that in combination account for most of the faculty stress (Gmelch, Lovrich and Wilke 1986).

These five major sources of frustration are:

1. **Reward and recognition**: The majority of stress emanates from this cluster of stress items, namely: inadequate rewards, insufficient recognition, and unclear expectation in all three areas of faculty responsibility – teaching, research and service.

2. **Time constraints**: This factor reflects faculty members’ feelings of insufficient time to keep abreast of current developments, inadequate time for class preparation, interruption from drop-in visitors, writing memos and letters, attending meetings, too heavy a workload and job demands interfering with personal activities.

3. **Departmental influence**: The third area deals with attempt to influence chairs’ decisions, resolving differences with chairs, understanding how chairs evaluate faculty performance and the overall lack of impact on departmental and institutional decision making.
4. **Professional identity**: The professional identity factor emerges since faculty reputation is built on scholarship: publications, presentations to conferences, grants, and research.

5. **Student interaction**: The final factor relates to the interaction between students and colleagues. Faculty members find themselves in conflict with students over evaluation, advising and teaching.

A comparison of sources and patterns of occupational stress reported by Israeli faculty (Keinan and Perlberg, 1987) to the American counterpart (Gmelch, Lovrich and Wilke 1984) revealed a similar ranking of the major sources of stress. The problem of stress in academic setting is generic, common to many disciplines and cultures rather than specific to few.

**Administration:**

Administration of the test is simple and straightforward. After establishing good rapport with the respondents and briefing them about the test, the investigator gave the test booklet to the respondents and asked them to complete it according to the instructions given by the investigator. All answers were made directly on the test booklet. The test can be administered individually or in groups at a time. Investigator administered the test both individually and in groups to the teachers as per the time availability of the teachers.

Though the test is simple but in cases where reading skills were limited or posed problem to respondent, words or phrases in the test was explained to them. The test is un-timed but typically requires 10-15 minutes by the respondent to fill it. Anyone taking unusually long time was reminded that the “first response” is what it is desired. Respondents read each of the stress item and rated them from NA (Not applicable) to “1” (rarely or never stressful) to “5” (frequently stressful).
METHOD AND PROCEDURES

Scoring:

Scoring of the test is also very simple. Each of the stress items are rated from 0 to 5 (i.e. 0,1,2,3,4,5.). According to rating given by the respondent to each of the question i.e. whether they rated the question 0,1,2,3,4 or 5 the marks were allotted accordingly. The marks allotted to all 48 questions were summed up and the total of all 48 questions was the stress level of each respondent.

II. IPAT ANXIETY SCALE QUESTIONNAIRE

IPAT Anxiety scale was developed by Samuel and Cattel (1976) as a means of getting clinical anxiety information rapidly, objectively and in a standard manner. IPAT is a standardized test. It is a brief, non-stressful, clinically – valid questionnaire for measuring anxiety, applicable to all above 14 years of age.

The test is easily administered individually or to large groups at a time. Finally, the IPAT Anxiety scale can be easily scored in about one-half minute using a standard key.
METHOD AND PROCEDURES

Component of the test:
The IP AT consists of 40 questions distributed among the five anxiety measuring factors (or components) according to each personality components’ centrality as a source or expression of anxiety. Division of items into (a) those which manifestly refer to anxiety, the score which may be called overt, symptomatic, conscious anxiety (in the last 20 items of the test), and into (b) the more covert, hidden-purpose cryptic probes in the first 20 items.

Reliability:
By the test reliability we mean the extent to which the test gives consistent results (scores). Reliability can take the form of consistency in test scores over time or consistency in answers from one question to another in the test.

Two types of reliability estimates are provided for the total IPAT test: test-retest (consistency over time) and internal consistency (consistency across items).

Averaging across and using the relationship between reliability and standard error of measurement, we arrive at the conclusion that the standard error of measurement for IPAT is approximately 3 raw score points or 0.5 sten. That is, about two-thirds of the time, the individual’s “true” anxiety score will fall within 3 raw score points or within one-half sten of the observed score.

Validity:
The validity of IPAT test is approached from three sources: a) how well the test score correlates with the pure anxiety factor it was designed to measure; b) how well the test score corresponds with clinical judgment regarding anxiety level, and c) how well the test score relates to other questionnaire measures of anxiety.

In summary, the validity of IPAT has been approached in three independent ways. The evidence from a number of factor analytic investigations, from studies of clinically assessed anxiety, and from other questionnaire measure of anxiety converges to the conclusion that the validity of the IPAT-the extent to which it measures the central core of the anxiety concept-approaches 0.90.
METHOD AND PROCEDURES

Administration:

Administration of the test is simple and straightforward. The test is undemanding verbally and non-stressful. Environmental conditions (lighting, ventilation etc.) were so adjusted as to provide a comfortable test setting. After introductory remarks for good rapport the investigator gave the test booklet to the respondent, and asked them to complete the test as per the instructions printed on the front page. All answers were directly made on the test booklet itself. The test can be administered individually or to a group at a time.

The test is un-timed but typically require only about five minutes for the examinee of average reading ability. Anyone taking unusually long time was reminded that it is the first response to each question, what is needed.

Scoring:

Investigator applied the cardboard stencil key directly to the test form and simply added 2’s or 1’s for each item, according to the figures printed by the hole through which the check mark appears. Three kinds of score are possible:

1. The single total anxiety score based on all 40 items. It was this score, which was required by the investigator.

2. A breakdown into a) an unrealized convert “cryptic question” anxiety score, Score A, b) an overt symptomatic, conscious anxiety score, Score B. Summation of Score A and Score B gives the total score which is used by the investigator.

3. The breakdown of total anxiety into the five personality components in anxiety.

C. RECORDING OF THE BLOOD PRESSURE

Ghai (1990) states that “the term ‘blood pressure’ used unqualified, refers to systemic arterial pressure. A variety of factors like cardiac output, elasticity of blood vessels, vasomotor tone, viscosity of blood, and its volume operate to maintain the resting level of arterial pressure. The effects of factors like emotional stress, muscular exercise and posture, produce transient change in B.P. Blood pressure is the lateral pressure exerted by the moving column of blood on the
METHOD AND PROCEDURES

walls of the blood vessels. With the pumping action of the heart the pressure rises to the maximum during systole and falls to the minimum level during diastole.

SPHYGMOMANOMETER

The blood pressure is measured with an instrument called Sphygmomanometer. The word Sphygmomanometer is derived from Greek roots – ‘Spy’ meaning pulse, ‘manos’ means thin and ‘meter’ refer to measurement. The apparatus has following components/parts:

a) Mercury reservoir: It contains mercury and is connected to the graduated tube at its lower end. A rubber tube attached to its opening at the top leads to an inflatable rubber bag.

b) Graduated tube: It is fitted to the lid of the apparatus along with the reservoir. It is graduated in millimeters (0-300), each division representing 2 mm.

c) Armlet (also called cuff): It’s a rubber bag 12 cm x 24 cm (for adults) enclosed in a strong inelastic cloth material. Two tubes are attached to the bag; one transmits the air pressure to the mercury manometer and other to the air pump.

d) Air pump: Is a rubber hand bulb provided with a one-way valve at its free end, and a leak valve arrangement at the other. A rubber tube connecting air pump to rubber bag, which can be inflated by turning the knurled screw clockwise & alternately compressing and releasing the bulb. Deflation of bag is achieved by turning the screw anticlockwise.

STETHOSCOPE

Its one use is in measurement of B.P. It has two end pieces, the bell type and the diaphragm type. The latter type is employed for recording B.P. It consists of plastic sheet firmly held in position by a metal ring. The ear pieces are designed so as to conform to the direction of the external auditory meatus in each ear.
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Procedure of Recording Blood Pressure:

The respondents were made to relax physically, and free from any excitement and anticipation by the investigator. The reading was taken from left arm of each respondent. Care was taken that the upper arm was at the level of the heart, and that no clothing constricted the arm. The cloth covered rubber bag was wrapped around the upper arm and inflated with air, till the higher extra – arterial pressure occludes the branchial artery. Lower end of the branchial artery, just medial to the tendon of biceps at elbow was located by palpation and the diaphragm of the stethoscope was placed over this region. Cuff pressure was lowered gradually around 2-4 mm per sec., until the first sound is heard, usually as a clear sharp tab. This reading was recorded which marks the systolic pressure. As deflation progressed the character of sound were found to change, varying through murmurs to banging and loud, then suddenly becoming ‘muffled’ (dull and faint, as if coming from a distance) and finally disappearing. The manometers reading at the instant the sound disappears marks the diastolic pressure. After which the bag was deflated to zero pressure. Investigator took three readings of such kind each time and took the mean of those readings.

Picture 3.2. – Investigator recording the B.P. of the teacher.
D. RECORDING OF HEART-RATE

Ghai (1990) expresses “Heart-rate is the number of heart beats for one minute. The heart-rate is not constant in any one subject; the rate varied slightly from beat to beat. Such fluctuations are random, but there is regular variation in heart-rate associated with respiratory movements. The rate quickens during inspiration and slows down during expiration.

Normal heart rate = 70-80 / min. and
Range is from 60-100/ min
Rate above 100/min is called tachycardia and below 60/min bradycardia. Emotional stress, nervousness, anxiety and apprehension produce tachycardia.”

For recording heart-rate the stethoscope was placed over the region of apex beat (mitral area) and two sounds were heard.

a) First heart sound: It is prolonged and of low pitch, and is usually the loudest sound heard over the heart. With high heart rates, the intensity of the first sound is increased.

b) Second heart sound: It is abrupt and clear, has a short duration, and of a higher pitch. This sound is split in some healthy subject. The intensity is commonly increased in hypertension. The first and second heart sound may be phonetically represented as ‘lub’ – ‘dup’. These two sounds together form one heart beat. The number of beats for one minute was counted by the investigator to determine the heart-rate of the respondent.

Picture 3.3. – Investigator recording the Heart-rate of the teacher.
E. RELAXATION TECHNIQUES

Relaxation is a change of pace or activity, which tends to reduce everyday tension and stress, lets the body recuperate from fatigue and restore energy. Ability of body to relax can be cultivated (Sharma, 1997).

Relaxation techniques used by the investigator consisted of four components namely:

1. Physical exercises
2. Breathing exercises
3. Relaxation exercises
4. Mental exercises

However in some cases the above pattern of exercises was altered to cater to the individual needs of the teacher.

The respondents were contacted with help of their principals. All possible efforts were made to make the teachers feel at ease. To attain this goal the investigator with the help of principal, chose a quiet comfortable room to carry out her relaxation therapy, and where there was least possibility of any kind of disturbance during relaxation therapy. Room was provided with chairs and a table. Environmental conditions (lighting, temperature, ventilation etc) were also given due consideration to make teachers comfortable and at ease. Therapy was administered individually and as well in groups depending on the time availability of the teachers. Each session lasted for time interval of 30 min to 50 min, depending on respondent to respondent. Before the start of the relaxation therapy, teachers B.P. and heart-rates were measured to find the initial level of B.P. and heart-rates in respondent. And were observed again after administering the therapy to discern the effect of relaxation therapy. The relaxation techniques adopted by investigator were selected from Singh, Gill, Rains, Brar and Rathee (2000), Sagar (1996), Edwin (1965), Sharma (2001), Jaggi (1973), Atkinson (1995), Sharma, Sharma and Varma (1996), Cratty (1989) and Sharpe (1992). Experimental group were administered various relaxation techniques in the sequence as narrated below.
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I. PHYSICAL EXERCISES: The purpose of these exercises is not merely to improve the physical condition of the body, but are devised to procure a relaxed and respective state of the physical body preparatory to the mental exercises. This group of exercises comprised of various warm ups, stretch ups, twists, tilts, and press-ups. They require 10 – 15 minutes to complete (These were selected from Singh et al 2000, Sharpe (1992), Sagar (1996) & Edwin (1965).

1. Warm ups: This group of exercises comprised of those exercises which prepare the body for more vigorous exercises and also helps one to go a long way in improving ones strength and stamina. They are as follows

i) Neck rolling: - Its a very useful warm-up exercise. It basically involves rolling your head round to the left, to the back and then to your right. Finally let your chin fall down to your chest. This cycle is repeated 10 times. Then this cycle is repeated 10 times again but in reverse order i.e. rolling your head from right to back to left and then resting on your chest. It is done slowly and without any jerks.

ii) Wringling of Toes and Hands: - Sit comfortably on a chair, back erect, stretch out both your hands and toes and rotate them first inwards to outwards 10 times and then again 10 times from outwards to inwards. It helps to strengthen and mobilize the joints of toes and hands.

iii) Stretching of Toes: Curl the toes down and in, towards the balls of the feet and squeeze tightly. Uncurl the toes and stretch them as much as possible. One can repeat as often one likes, until the feet begins to tire. This exercise can be done in standing, sitting and even in lying down position.

iv) Arm Circling: Stand with your feet slightly apart. Stretch your arms out to the sides, with palms facing upwards. Rotate the arms in small circles clockwise and then anti-clockwise. Repeat 20 times.

v) Simple forward bend: Keep your feet astride. arms stretched above head. Bend slowly forward to touch floor and then stretch upwards. Repeat this whole process 10 times.
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vi) **Knee raising**: Stand erect with your feet together. Raise your left knee as high as possible and to the extent you find it comfortable to do so. Hold in this position for as much time as you can. You can also use your hands to support your knees. Keep your back straight. Lower foot to the floor. Repeat with right knee. Repeat this exercise thrice with each knee.

![Teachers in Knee-raising pose.](image)

Picture 3.4. – Teachers in Knee-raising pose.

2. **Stretch-ups**: These group of exercises help in preventing stiffness in various parts of body.

   i) **Upward stretch**:

   a) Stand with your feet apart and hands cupped upwards with the back of fingers touching the abdomen.

   b) Slowly swing the hands first down and then in a wide circle up the sides and then above the head. Clasp the fingers above the head. Take a deep breath in while raising the arms.

   c) With the fingers still interwined, turn the palms, facing upwards. Hold your breath all the while; push your hands up and away from
you with one big stretch as long as you are able to stand in this position.

d) Reverse the procedure and swing the hands down in a wide circle back to the starting position while breathing out forcefully through the mouth.

e) Take a deep breath in.

f) Breathe out. Continue to breathe normally now.

g) Relax.

h) Do this only once.

ii) Sideways Stretch:

a) Take in a deep breath and bring up your arms in a big circle above the head. Turn the palms away and push up, as in previous exercise and hold the breath.

b) Now slowly bend sideways over to the left as far as you can go. Hold in this position for few moments and straighten up. Now bend towards your right and go as far as you can. Straighten up and bring your hands back above your head.

c) Breathe out forcefully and bring your hands down in a wide circle to the starting position.

d) Take a deep breath.

e) Breathe out. Continue to breathe normally now.

f) Relax.

iii) Forward and backward stretch:

a) Repeat the last procedure but instead of bending sideways, bend forwards and backwards as far as you can go. Hold your breath all the while.

b) Return to the starting position swinging your hands in a wide circle, breathing out forcefully.

c) Take a deep breath in.

d) Breathe out. Continue to breathe normally and relax.
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iv) **Circular stretch :**
a) Repeat the above procedure, but this time, as soon as your hand are above your head, bend forwards as far as you can go and then, without straightening up, swing round to the right side, then backwards, then to the left side and then to forwards again in a wide circular movement. Without stopping, reverse the procedure bending to the left, backwards, to the right, forwards and then straighten up-holding the breath all the time.
b) Breathe out forcefully.
c) Take a deep breath in.
d) Breathe out. Return to normal breathing.
e) Relax

v) **Hand stretch :**
a) Sit comfortably on a chair and place your hands on the thighs, palms down.
b) Lift the hands up and stretch out and open the fingers and thumbs as much as possible.
c) Let the hands drop back onto the thigh.
d) Repeat several times.

3. **Twists :** These group of exercises help to mobilize the joints of upper back and neck. All movements are to be done slowly, stretching the muscles and ligaments as far as possible.

i) **Sideways necks twists (1) :**
a1) Twist your head sideways to the right as far as you can. Hold this position for a few movements then slowly twist the head round to the left as far as you can do. Hold this position then look straight ahead.
b1) Repeat the manoeuver once or twice more.
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ii) Sideways neck Twist (2):
a) Slowly bend your neck sideways and attempt to place your right ear on your right shoulder. Hold this position then swing over to the other side and attempt to place the left ear on your left shoulder. Hold this position and then straighten up.
b) Repeat the procedure once or twice more.
c) Relax

Picture 3.5. – Teachers doing Sideways neck Twists (2).

iii) Forward and Backward neck Twists:
a) Bend the neck forward, pressing the chin on your breast bone. Hold this position then bend the neck backwards pushing the head back as far as possible. Hold this position then return the head to starting position.
b) Repeat the manoeuvre once or twice more.

iv) Spinal Twists:
a) Stand with your feet together and your arms at your sides.
b) Slowly raise yourself and stand on the tips of your toes.
c) Raise the arms up in front of you until they are parallel to the floor. The palms must face downwards.
d) Remain standing on the toes with the eyes focused on the backs of your hands. Slowly swing the arms round to the left, twisting the trunk to the left as far as possible. Try to keep your feet facing forwards and if possible, remain on your toes. Hold the extreme position for five seconds.

e) Slowly twist back to the starting position.

f) Relax

g) Repeat the procedure to the right side.

h) Repeat the entire exercise twice more i.e. thrice on each side.

4. **Tilts**: They help to prevent tension building up in neck and shoulders.

i). **Head tilting forwards**:

a) Sit yourself on a chair in a corrected posture. Clasp the hands loosely on the upper part of the back of the skull where they act as extra weight. Move your elbows forwards at either side of the face.
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just above eye level. There should be no undue tension in the arms or shoulders. Press this chin inwards and retain this posture throughout the exercise.

b) Carefully tilt the head forwards keeping the chin in, until you feel a stretch in the back of your neck. Do not push with your arms.
c) Try to hold the position until the stretching at the back of the neck subsides, in case the stretch becomes too much lift the head a little.
d) Tilt the head further forwards if you feel you can take a bit more stretch.
e) Gently lift the head and lower the arms.
f) Relax.
g) Repeat this 2-6 times.

ii) Head tilting sideways:

a) Place your left hand across the top of the head to act as extra weight. Press the chin inwards and keep it there throughout the exercise.
b) Tilt the head sideways to the left until you feel a stretch in the right side of the neck. Do not push the head with hand. Keep the right shoulder well pulled down by lightly holding onto the leg of the chair with right hand.
c) Hold the position where you feel good but bearable stretch keeping the chin in.
d) Lift the head upright and lower the arm.
e) Do the exercise to the right using the right arm.
f) Now relax.
g) Do only once.

iii) Head tilting diagonally forwards:

a) Face squarely towards one wall of the room. Turn the head only (not shoulders) a quarter turn to face the left front corner of the room. Put the left hand across the top of the head so that the finger tips touch the right-side of the back of the skull behind the ear.
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Hold chair with the right hand to anchor the right arm. Press the chin inwards and keep it there.

b) Tilt the head forwards so that your forehead faces down towards your left knee. You should feel a stretch from the right shoulder blade to the base of the skull on the right side.

c) Hold the position where you feel a good but bearable stretch, keeping the chin in.

d) Lift the head upright and lower the arm.

e) Now do the exercise facing the right front corner of the room using the right arm.

f) Relax

5. **Press-ups** : They help to increase the strength of the given group of muscles on which you are working.

i) **Head pressing backwards** :

   a) Sit on a comfortable chair and clasp your hands loosely on the back of the head. Press the chin inwards and retain this throughout the exercise.

   b) Press the head backwards into the hands pressing forward with the hands at the same time, so that the head does not actually does not move.

   c) Stop, holding the head and hands in position. Press again and stop.

   d) Repeat 2-6 times.

   e) Relax.

ii) **Hand – Press** :

   a) Stand in front of a wall.

   b) Bring your hands in front, at chest level with palms open and parallel to wall.

   c) Press the wall with both your hands.

   d) Relax.

   e) Do this procedure as many times you feel like doing so.
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II. BREATHING EXERCISES: These exercises help in producing further relaxation of the body and also have a soothing and relaxing effect on the mind. These group of exercises consist of vast number of exercises, but investigator selected only, a few which are described as follow. They took 5 – 10 minutes to complete. (These were selected from Jaggi (1973), Atkinson of (1995), Sharma et al (1996).

1. Single-Nostril Breathing:
   a) Sit in any meditative pose, keeping the spine, neck and the head in a straight line. One can do this exercise while sitting on a chair/stool too
   b) Close the right nostril and inhale slowly through the left nostril
   c) Exhale through the left nostril in twice the time of inhalation
   d) Repeat this five to ten times
   e) Now, close the left nostril with the right ring finger and the little finger, and inhale through the right nostril
   f) Exhale through the same nostril in twice the time of the inhalation That makes one round Repeat 5-10 times
   g) Relax. Resume normal breathing.

2. Alternate Nostril Breathing:
   a) Close the right nostril with the right thumb & inhale through the left nostril
   b) Now close the left nostril with the right ring finger and the little finger. Remove the thumb from the right nostril and exhale through the right nostril. This makes half a round
   c) Now without pausing, inhale through the right nostril. Close the right nostril with the right thumb and exhale through the left. This makes one full round
   d) Do this procedure 5-10 times
   e) Relax and resume to normal breathing.
3. 

**Cooling Exercise**: It is like Alternate – nostril breathing with only addition of breath holding in it.

a) inhale air through the left nostril and retain it for double the time of inhalation.

b) Exhale through the right nostril, taking as much time as it was for retention of breath.

c) Now without stopping, inhale through the right nostril and retain it before exhalation through the left nostril. This is one full round.

d) Practice it five to ten times.

e) Relax and resume normal breathing.

**RELAXATION EXERCISES**: These exercises relax the entire musculature of the body systematically, leaving one free to concentrate on the mental aspect of psychokinesis. To attain this purpose the investigator used autogenic training, which lasted for 10 – 15 minutes. Cratty (1989), Atkinson (1995), Sharma et al (1996) and Sharma (2001).

**Autogenic Training**: Means self-generating. It is a systematic programme that teaches the body and mind to respond quickly and effectively to verbal commands to relax and return to a balanced, normal state. It comprises of a series of phrases.
which one can repeat to oneself as self- or auto-suggestion. Verbal commands are given in the following stages:

1. It focuses on the theme of heaviness, which leads to the feeling of relaxation.
2. It brings about peripheral vasodilatation, which helps to divert blood to the brain and muscles.
3. The third stage focuses on normalizing the cardiac activity.
4. The fourth stage regulates the respiratory system. By repeated suggestions it helps to restore normal, natural and rhythmic breathing.
5. In the last stage it helps to reduce the flow of blood to the head, thereby enhancing the feeling of relaxation.

Picture 3.8. – Investigator administering Autogenic technique to the teachers.

MENTAL EXERCISES: By this time or at the end of relaxation exercise stage, one is in a fully relaxed state. In other words one’s body is completely relaxed physically. To relax mentally investigator used meditation and mental imagery to achieve this end, which took 5 - 10 minutes to complete. (Edwin 1965, Jaggi 1973, Atkinson 1995, Sharma et al 1996, Cratty 1989, Sharma 2001).

1. Meditation: Or Transcendental Meditation as better called, helps in reducing the nervous stimulation which produces a relaxing effect. The investigator asked the subject to sit in a chair in meditative posture i.e.
with head, neck and trunk erect and in a straight line. Then to close their eyes and mentally recite any mantra, word or phrase which they want to choose and feel at ease while reciting. The process of meditation was carried out for the period of time for which the respondent felt like doing so, which was usually for 3 – 5 minutes.

2. **Mental Imagery**: Mental Imagery goes a long way in effectively reducing stress. Subjects were asked to sit comfortably, close their eyes and visually imagine — anything to any scene. Like for instance, they were at times asked to imagine a flower of their choice, colour and feel the flower as if it were actually present. Feeling was in the form of smell, touch, etc. Similarly to imagine a serene and a relaxing scene.

This brings us to the close of the relaxation therapy. Subjects were asked by the investigator to slowly come to their normal state as a sudden change may cause undue shock to the body or mind in form of the muscle twitch etc. Investigator again took the teacher’s B.P. and heart-rate and noted them down. Before departing investigator extended thanks to the teachers for extending out of way co-operation.
3.5. STATISTICAL TECHNIQUES EMPLOYED

Statistical techniques employed by the investigator were mean, standard deviation, t-test, paired t-test, histogram and line graphs.

1. Mean or arithmetic mean was used as a measure of central tendency as it is best used when the distribution of scores is balanced and unimodal.

2. Standard deviation a measure of variability was used to indicate how far all scores in a distribution vary from the mean.

3. Descriptive statistics such as means, S.D’s and percentages were computed to study the nature of distribution for score for all the variables of job-stress, anxiety, B.P., hypertension and Heart-rate.

4. t-test a test on ordinal data of the hypothesis of difference between two sample groups when the selections are correlated (as in matched – group design) was employed.

5. Paired t-test was used as when two distribution of interval data to be compared for possible differences and the data results from either a B/A or M/S design i.e., when there is correlation between the pairs of scores.

6. The t-ratio’s were obtained to find out the significance of differences between the means of experimental and control group variables, differences between per-test and post-test scores and values of experimental group, and to study difference between high and low stressed groups.

7. Histograms and Line graphs for graphical representation of data.

3.6. PROCESSING OF DATA

The raw data was statistically treated and processed on IBM Pentium- II Computer installed in Dept. of Computer Science and Application, Panjab University; Sector-14; Chandigarh.