Chapter III

Methodology

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  - Design of the Study
  - Sample Selected for the Study
  - Tools Used for the Study
  - Description of Tools
  - Procedure of Data Collection
  - Statistical Techniques Adopted

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  - Variables of the Study
  - Design of the Study
  - Sample Selected for the Study
  - Tools Used for the Study
  - Description of Tools
  - Scoring and Consolidation
  - Statistical Techniques Adopted
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The quality of the methods and methodologies adopted for the research ensures the quality and scientific status of any research process and product. The aim of any study is fulfilled through the appropriate methodology.

The present study examined the effectiveness of Bibliotherapy and Progressive Muscle Relaxation for reducing Academic Stress of secondary school students. Preparation of suitable tools, materials, collection of relevant data and statistical processing are required for hypothesis testing.

The study was conducted in two phases. The first phase of the study was a survey to find out the relevance for conducting the present study. The second phase consisted of the experimentation phase to find out the effectiveness of Bibliotherapy and Progressive Muscle Relaxation for reducing the Academic Stress of secondary school students.

First Phase- Survey

The first phase of the study was conducted under the following headings.

- Variables of the Study
- Design of the Study
- Sample Selected for the Study
- Tools Used for the Study
- Description of Tools
- Procedure of Data Collection
- Statistical Techniques Adopted
Variables of the Study

In the survey phase the views of teachers on Academic Stress Reduction Programme and views of students on Academic Stress Reduction Programme were taken as the variables.

Design of the Study

The investigator carried out a descriptive survey on teachers and students from randomly selected schools of Kozhikode district.

Sample for the Study

Sample consisted of 50 language teachers from randomly selected schools and 400 secondary school students from randomly selected schools of Kozhikode district.

Tools Used for the Study

1. Questionnaire on Views of Teachers on Academic Stress Reduction Programme (Meera & Praseeda, 2011).
2. Questionnaire on Views of Students on Academic Stress Reduction Programme (Meera & Praseeda, 2011)

Description of Tools

The investigator conducted a survey among secondary school students and high school teachers to understand whether there exists any need for stress reduction interventions in the schools. Questionnaire was used to find out the views of students and teachers on the need for a stress reduction intervention for secondary school students. Questionnaire consisted of student’s version and Teacher’s version. Each questionnaire consist of 15
items which is in ‘Yes’ or ‘No’ form. The questions were focused on the need for a stress reduction intervention in schools. The items were prepared by surveying the related literature and discussion with field experts. Both versions of questionnaire consisted of personal information as first part. The students version included items based on need for stress reduction whether they feel stress, is there any method in schools for reducing stress etc. In the teachers version items are based on the need for stress reduction, practical difficulties in using stress reduction interventions, present situation of children etc.

A draft questionnaire was prepared and administered on a small sample of 30 students and 10 teachers and necessary modifications were made for preparing the final questionnaire.

Example for teacher’s version of questionnaire-

Eg:- Do you feel that stress can be reduced through different stress reduction activities?

Example for student’s version of questionnaire-

Eg:- Do you feel that stress management programmes can be effectively given at schools?

Validity and reliability.

The content validity, face validity and predictive validity of questionnaires were ensured by the investigator. Reliability of the questionnaire was established using test-retest method and reliability co-efficient of teacher’s and student’s version of questionnaire are 0.67 and 0.69 respectively. Copies of questionnaires were given as Appendix I and II.
Procedure of Data Collection

The tools were administered to teachers and students and the responses were scored. The number of items scored ‘Yes’ was taken for analysis.

Statistical Analysis Adopted

Percentage analysis was used to analyse the data collected.

Second Phase- Experimentation

The second phase of the study was conducted under the following headings.

- Variables of the Study
- Design of the Study
- Sample Selected for the Study
- Tools Used for the Study
- Description of Tools
- Scoring and Consolidation
- Statistical Techniques Adopted

Variables of the Study

In the present study, two independent variables and one dependent variable were involved.

Independent variables.

- Bibliotherapy
- Progressive Muscle Relaxation
Dependent variable.

- Academic Stress

Variables

Independent Variable

- Bibliotherapy
- Progressive Muscle Relaxation

Dependent Variable

- Academic Stress

Design of the Study

The experimental phase was intended to find out the effectiveness of Bibliotherapy and Progressive Muscle Relaxation for reducing Academic Stress and to compare it with a control group. The design is illustrated below.

\[ G_1 \quad O_1 \quad X_1 \quad O_4 \]
\[ G_2 \quad O_2 \quad X_2 \quad O_5 \]
\[ G_3 \quad O_3 \quad - - \quad O_6 \]

Where \( G_1 \) – Bibliotherapy Group

- \( G_2 \) – Progressive Muscle Relaxation Group
- \( G_3 \) – Control Group
- \( O_1 \) – Pretest for Bibliotherapy Group
- \( O_2 \) – Pretest for Progressive Muscle Relaxation Group
- \( O_3 \) – Pretest for Control group
- \( O_4 \) – Post test for Bibliotherapy Group
- \( O_5 \) – Post test for Progressive Muscle Relaxation Group
- \( O_6 \) – Post test for Control Group
- \( X_1 \) – Bibliotherapy
- \( X_2 \) – Progressive Muscle Relaxation
Pre-test post-test non-equivalent group design was employed. Bibliotherapy and Progressive Muscle Relaxation were given to two experimental groups and no such intervention was given to control group.

**Sample Selected for the Study**

For the experimental phase, the inconvenience in manipulating large sample made the investigator select sample from a school randomly selected from the list of schools selected for survey. The experimental groups and control group were selected from same school, because change in school environment may affect the Academic Stress of students. As intact classroom groups were taken random assignment of subject was not possible. Therefore three classes were randomly taken as Bibliotherapy Group, Progressive Muscle Relaxation Group (experimental groups) and Control Group. To ensure the similarity of control group with experimental group, the investigator tried to match the settings as far as possible. Only gender of students was taken as criterion for subsamples. Distribution of the sample was given in Table 4

<table>
<thead>
<tr>
<th>Groups</th>
<th>Boys</th>
<th>Girls</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Control</td>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
</tbody>
</table>
Tools Used for the Study

The following tools were used for the study.

1. Academic Stress Inventory (Meera & Praseeda, 2012)
2. Bibliotherapy Lesson Frames (Meera and Praseeda, 2012)
4. Progressive Muscle Relaxation Technique (Based on Jacobson Progressive Muscle Relaxation Technique).

Description of Tools

**Academic Stress Inventory.**

Academic Stress Inventory was prepared by the investigator with the help of supervising teacher for the present study. From the review of different tools for assessing Academic Stress, researcher found that those instruments were inadequate to go deep into the stressors of students concerning their academic field for the present study. So it was decided to develop an inventory especially useful to measure the Academic Stress for the purpose of present study. It was then decided to construct a tool for measuring Academic Stress based on Likert Scale format.

**Planning and preparation of the tool.**

Academic factors influencing the adjustment of students in academic area is considered for developing the academic stress inventory. Prior to the development of inventory, investigator met some secondary school students and had a free talk with them about the different factors that affected them in
their studies and life at school. As varieties of factors were given by the students, investigator analyzed them and grouped them regarding their nature. Most of the students mentioned about attitude of parents, and teachers, school environment, self confidence, friendship, teaching learning process and so on that create difficulties for them. From the review conducted investigator also identified certain factors adding to the academic stress of students.

Main factors that create academic stress for the students as identified by the investigator includes,

1. Personal stressors
2. School stressors
3. Family stressors
4. Peer stressors

The subcomponents of these major factors include

- Personal stressors
  - Lack of self efficacy
  - Lack of personality hardiness
  - Lack of achievement motivation
  - Lack of optimism

- Family stressors
  - Lack of parental support
  - Lack of interaction between parents and children
  - Lack of parental involvement in studies
  - Lack of study facilities at home
Methodology

- School stressors
  - Lack of good teachers behaviour
  - Lack of student friendly teaching learning process
  - Lack of proper physical environment at school
  - Undesired school policies

- Peer stressors
  - Peer stress as such is taken as a component and different aspects of peer relations are included in the inventory which almost cover the areas that add to the academic distress of the students.

- Personal stressors
  - Lack of self-efficacy.

  General self-efficacy is one’s competence to cope with a broad range of stressful or challenging demands (Luszczynska, Scholz & Schwarzer, 2005). The self efficacy approach highlights way in which individuals perceive their capacities rather than the recording of actual behaviour. It focuses on beliefs that an individual holds about his/her or capacity to deal effectively with a particular situational demand. Self efficacy is the hallmark of people who judge themselves as able to handle situations that would otherwise be intimidating or overwhelming. Such people believe they have an ability to control anxiety and exercise control over potential threat. Developing self-efficacy or belief in one’s own abilities to deal with stress is of considerable value.

  - Lack of personality hardiness.

  Hardiness is a personality style associated with superior resistance to stress. Persons with hardiness have a sense of personal commitment to self,
work, family and other stabilizing values. They feel that they have control over their lives and their work. Such persons have a tendency to see life as a series of challenges rather than as a series of threats or problems, Coon (2004).

Lack of achievement motivation.

Motivational research has proposed that reaching personal goals is an important prediction of subjective well being (Martin and Tesser, 1996). When the personal goal orientation are congruent with motive disposition, they are associated with high emotional well being and vice versa. Students who are mastery-oriented are interested in self-improvement and tend to compare their current level of their achievement to their own prior achievement. Studies shows that motivation not only influence the effectiveness of learning, but that being intrinsically motivated is also associated with better well being and an increased amount of satisfaction (Ryan and Deci, 2005).

Lack of optimism.

Optimism is characterized by positive expectations of the future and has been linked to the process of coping with stress. Optimism has a profound impact on one’s expectancies and therefore can serve as a useful predictor of behaviour. It is found that optimism serves as a moderator between stress and psychological well being and also has a direct impact on psychological adjustment (Krypel & King, 2010).
**Family stressors.**

Lack of parental support.

Lack of parental support in the studies of children affects the children and causes stress for them which leads to Academic Stress. According to Gonzales-Pienda (2002) stated that parental support criteria were developed to according to six dimensions namely, Parents expectations about their children’s achievement, Parents expectations about their children’s capacity to achieve important goals, Parents behaviours that reveal interest in their children’s school work, Parents degree of satisfaction or dissatisfaction with their children’s level of school achievement, Parents level and type of help provided when their children do homework and Parents reinforcement behaviour of their children’s achievement. So lack of such parental support may affect the psychological well being of students.

Lack of interaction with parents and children.

Regarding the interaction or communication between parents and children it is striking that even limited pleasant interaction can provide a basis for development of positive self regard and helps in development of vulnerability of resilience.

Lack of parental involvement in studies.

Parental involvement takes many forms including good parenting in the home, including the provision of a secure and stable environment intellectual stimulation, parent child discussion, good models of constructive social and educational values and high aspiration relating to personal
fulfillment and good citizenship; contact with schools to share information; participation in school events; participated in the work of the school and participation in school governance. The most important finding is that parental involvement in the form of ‘at-home good parenting’ has a significant positive effect on children’s achievement and adjustment even after all other factors shaping attainment have been taken out of the equation (Desforger & Abouchaar, 2003).

Lack of study facilities at home.

Philips (2008) suggested that young people are more aggressive due to disorderly homes, catastrophic breakdown of parenting, emotional choices and absence of love and care in their disorderly homes increasingly result in aggression as their instinctive response to the slightest setback. Students do not have appropriate role models to support them. The disintegration of nuclear and extended families has led to the disappearance of formally effective support mechanism (as cited in Dave 2009). Moreover attitude of parents, and priority they give to other things such as TV, Radio and other entertainments, also adds to the home situations which induce stress in children.

*Stress creating factors at school.*

Lack of good teacher behaviour.

Personality, character, attitudes and observable actions are all factors that determine the effectiveness of teacher-student relationships. Students usually try to live up with a teacher’s expectations. If a teacher expects the worst of his students, they seldom disappoint him. On the other hand if he
believes in them and show confidence in their ability to become good citizens students usually justify that faith (Alcorn, Kinder & Schunert, 1970).

Lack of student friendly teaching learning process.

The formal teaching learning program sometimes fails to meet the needs of many students who represent such diversity in interest abilities and backgrounds. Where there is no immediate relief from the dissatisfaction of students with the curriculum the teacher will need to exercise the atmost imagination and ingenuity to create interest in students in the works to be done. Not only curriculum but the methods used by teachers are also important. Monotonous routines and inappropriate instructional procedures lead to behaviour problems (Alcorn, Kinder & Schunert, 1970).

Lack of proper physical environment at school.

The importance of a healthy, beautiful and refreshing environment which soothe the eyes and refresh the soul and where the intellectual forces of teachers and pupils function at their best is apparent when we realize that the students spend a good deal of their time in school premises (Aggarwal, 1972). Dingy, crowded and unattractive maintenance may lead to confusion and disorder. Maintenance of proper temperature, ventilation and lighting in the classroom are important for good physical and mental health of students.

Undesirable school policies.

Over disciplinary actions contribute to truancy, defiance and a tense classroom atmosphere. At the same time, well behaved children and adolescents who are given leeway in making their own decision at school
experience strong self-efficacy and this supports academic success (Deci & Ryan, 2000).

*Peer relations as stressors.*

Relationships are of vital importance to teenagers life. The esteem of friends and support gained from a stable friendship group is central to most young people’s feelings of happiness and well being at a time when they are acutely aware of changing body image and establishing their identity in terms of personal opinions and beliefs. In their desire to be accepted as a part of an ‘in’ group, young people can be vulnerable to peer stress (Harries, 2006).

*Item writing.*

Based on the models of academic stress inventories discussion with experts and interview with students, investigator prepared the items in Malayalam for the convenience of secondary school students. The items were then given to the experts in the field for evaluation. According to their suggestions required changes were made on the items to improve their clarity and worthiness. The investigator prepared 70 items regarding various aspects of 4 major stressors identified. All the items were further scrutinized by experts.

Illustrative items from the draft inventory are the following.

*Stress creating personal factors.*

Lack of self efficacy.

Eg: Inability to carry out the duties assigned to me properly.

Lack of personality hardiness.

Eg: Experiencing difficulties.
Lack of achievement motivation.

   Eg: Not studying the daily lessons properly.

Lack of optimism.

   Eg: Lack of belief that things will happen in a good way.

*Stress creating family factors.*

Lack of parental support.

   Eg: Unnecessary scolding and punishments of parents.

Lack of interaction between parents and children.

   Eg: Lack of freedom to share my personal matters with parents.

Lack of parental involvement.

   Eg: Parents are not enquiring about my difficulties in studies.

Lack of study facilities at home.

   Eg: Lack of proper place at home for my studies.

*Stress creating school factors.*

Lack of proper physical environment of school.

   Eg: Insufficient ventilation and lighting in the classroom.

Lack of good teacher behaviour.

   Eg: Ridiculing of students by teachers.

Lack of student friendly teaching learning process.

   Eg: Teachers are not revising difficult portions.
Undesirable school policies.

Eg: Teachers are not controlling misbehaviour in school.

Peer relationships.

Eg: Friends are avoiding me.

**Mode of Responding and Scoring**

The inventory was administered on secondary school students. Students were asked to read each item and have to decide how far each situation is stressful to them. Responses were made in a five point scale as very severely, severely, moderately, feebly, not at all. As the items were prepared to measure how much they are stressed all the items are given in such a way to categorize their intensity of stress. So items are not categorized as positive or negative items. The scoring pattern of the tool is as following.

<table>
<thead>
<tr>
<th>Very Severely</th>
<th>Severely</th>
<th>Moderately</th>
<th>Feebly</th>
<th>Not at all</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

The total score was taken as the stress level of each subject. For a particular item (stressor) the subject may be having a maximum of 5 score or minimum of 1. The draft inventory is given in Malayalam and English as Appendix III and V respectively.

**Item analysis for standardization.**

The inventory in the final form was prepared by selecting statements on the basis of item analysis for which draft inventory was administered on a
sample of 370 secondary school students of Kozhikode and Malappuram districts. As it is a tool based on Likert format, discriminating power was calculated for selecting the items.

The procedure suggested by Edward (1957) was used for item analysis. The response sheet of 370 students were arranged in rank order of the obtained score. The top 27% of students and bottom 27% of students were taken as high and low group respectively. For calculating the discriminating power t-value for each item was calculated using the formula

\[
t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\sum(X_H - \bar{X}_H)^2 + \sum(X_L - \bar{X}_L)^2}{N(N-1)}}}
\]

\(\bar{X}_H\) = Arithmetic mean of the given item for high group

\(\bar{X}_L\) = Arithmetic mean of the given item for low group

\(X_H\) = Score of high group

\(X_L\) = Score of low group

\(n\) = number of subject in the group

The value of ‘t’ is a measure of extent to which a given statement differentiates between the high and low groups. The item for which ‘t’ value is greater than or equal to 1.75 was regarded as an item, which possess internal consistency (Edward, 1957). Out of 70 items only 52 were selected for including in the final test. The ‘t’ value of all the 70 items were calculated and items having ‘t’ value 5.25 and above only were selected for the final tool. The details of item analysis is given in Table 5.
Table 5

Details of Item Analysis of Academic Stress Inventory

<table>
<thead>
<tr>
<th>Item No.</th>
<th>t-value</th>
<th>Item selected</th>
<th>Item No.</th>
<th>t-value</th>
<th>Item selected</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>2</td>
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<td>9.89</td>
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</tr>
<tr>
<td>3</td>
<td>14.43</td>
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<td>38</td>
<td>7.09</td>
<td>Selected</td>
</tr>
<tr>
<td>4</td>
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<td>7.68</td>
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</tr>
<tr>
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<td>3.26</td>
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</tr>
<tr>
<td>6</td>
<td>5.53</td>
<td>Selected</td>
<td>41</td>
<td>7.25</td>
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</tr>
<tr>
<td>7</td>
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<td>42</td>
<td>8.52</td>
<td>Accepted</td>
</tr>
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<td>8</td>
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<td>Selected</td>
<td>43</td>
<td>8.15</td>
<td>Selected</td>
</tr>
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<td>Selected</td>
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<td>50</td>
<td>7.48</td>
<td>Selected</td>
</tr>
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<td>16</td>
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<td>6.02</td>
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<td>3.97</td>
<td>Rejected</td>
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<td>5.94</td>
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<td>23</td>
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<td>6.01</td>
<td>Selected</td>
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<td>24</td>
<td>7.09</td>
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<td>6.69</td>
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<td>12.32</td>
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</tr>
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<td>26</td>
<td>1.56</td>
<td>Rejected</td>
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<td>7.06</td>
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<td>9.27</td>
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</tr>
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<td>3.81</td>
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</tr>
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<td>2.03</td>
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<td>6.72</td>
<td>Selected</td>
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<td>8.24</td>
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<td>3.86</td>
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<td>66</td>
<td>8.52</td>
<td>Selected</td>
</tr>
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<td>32</td>
<td>10.42</td>
<td>Selected</td>
<td>67</td>
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<td>Selected</td>
</tr>
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<td>33</td>
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<td>Rejected</td>
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<td>2.80</td>
<td>Rejected</td>
</tr>
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<td>34</td>
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<td>35</td>
<td>6.00</td>
<td>Selected</td>
<td>70</td>
<td>8.77</td>
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</tr>
</tbody>
</table>
The distribution of item in final inventory is given in Table 6.

Table 6

*Distribution of Items in the Final form of Academic Stress Inventory*

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Components</th>
<th>Selected Items</th>
<th>Total No. of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Personal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Self-efficacy</td>
<td>4,9,14,19,24</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Hardiness</td>
<td>30,34,38</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Achievement Motivation</td>
<td>54,58,67</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Optimism</td>
<td>42,46,50</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Familial</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Parental support</td>
<td>5,10,15,20</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Interaction between parents and children</td>
<td>25,31,35,39</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Study facilities at home</td>
<td>43,47,51,55</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Parental involvement in studies</td>
<td>27,59,64,70</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>School</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Teachers Behaviour</td>
<td>22,32,37,62</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Teaching learning process</td>
<td>41,44,48,53</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>Physical Environment of School</td>
<td>1,6,12,16</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>School policies</td>
<td>57,61,66,69</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Peer Relations</td>
<td>3,8,13,18,23,28</td>
<td>6</td>
</tr>
</tbody>
</table>

*Validity.*

Content validity, face validity and criterion validity were established for the Academic Stress Inventory.

*Content validity.*

Content validity was established by evaluating the relevance of the test items individually and as a whole. Each item should represent the aspects
which was measured and as a whole the items should constitute a representative sample of the measured variable. For establishing content validity the researcher conducted informal discussion and interview with secondary school students. Review of related literature and experts in the field also contributed for establishing content validity. So it is assumed reasonably that the inventory has content validity.

Face validity.

In order to ensure face validity the statements in the inventory were prepared with least ambiguous way to assess the stress of secondary school students. It was also assessed by the experts in the field of psychology and education.

Criterion related validity.

The criterion validity of inventory was established using Academic Stress Scale developed by Taragar & Yadav (2009) as external criterion. Both the tools were administered on a sample of 40 students. Correlation coefficient through Pearson’s Product Moment Correlation method was found out using the responses collected. The obtained co-efficient of correlation was 0.87.

Reliability.

The test-retest method was used to establish reliability. The test was administered on 40 students and after two weeks same test was again administered on the same subjects. The response obtained were subjected to Pearson Product Moment Correlation method and the correlation coefficient obtained was 0.81.
The final tool in Malayalam and English version along with response sheets are given in the Appendix IV and VI respectively.

**Bibliotherapy Lesson Frame**

From ancient times itself it has been said that stories have purgative power over the emotions of human beings. So considering the case of school students it is known fact that students are under various emotional problems that lead to various stress. Investigator also found out from a survey conducted that students are in need of some interventions to reduce their distress in academic area. As a language teacher, investigator herself felt the purgative effect and influence of different literary works. So the investigator thought about helping the students in reducing their academic stress through stories. As language teachers have so many opportunities to keep in touch with literature they can select suitable stories for their children and utilize sometimes for the well being of their students. But some sort of planning and execution is inevitable for the successful interaction of these stories as an intervention for the children to get their stress reduced. The investigator reviewed many literature and found different models of Bibliotherapy plans for using bibliotherapy in classroom context. From the different ways and methods and lesson plans and lesson frames from western literature investigator prepared a lesson frame that can be made use of by the teachers.

The most difficult task in the preparation of these lesson frames was the selection of stories and works suitable for the children. While selecting the stories some of the major things to be kept in mind. They are:
The story should contain problem felt by the children.

- It should be according to the age level of child.
- It should be an interesting story.
- It should be a story presentable by the teacher.
- Teacher should be able to identify the outcomes that are possible from a story.
- Teacher should be able to plan different activities in the lesson frame using the story.

The teacher has to make an assessment about the stress and problems of the whole class or an individual student and have to select a story and develop a bibliotherapy lesson frame for helping the students. Another important aspect is how the teacher presents the story before the students. Teacher should give the therapy in such a way that students should be attentive and should be able to identify them with the characters in the story and should be able to internalize it.

Different stories were analyzed for the purpose of preparing a lesson frame and these stories that go along with the components of Academic Stress were selected. Stories were selected using the internet facility and other sources available. After selecting many stories, again it was analyzed and only 12 stories out of many were selected. Eleven stories were selected from the book ‘101 Healing Stories for Kids and Teens: Using Metaphors in Therapy. One story was taken from course book of 10th standard. Stories selected were adapted in order to make it suitable for the cultural context and to satisfy the purpose intended.
Preparation of lesson frame.

Here the lesson frame is an organized collection of different stories which can support a procedure or process.

- First of all the investigator went through different stories and selected some stories which contained some of the problems related to Academic Stress of secondary school students.
- A close reading of the stories to identify the points and problems that should be emphasized in that particular story.
- Listing out the problems dealt in the story.
- Listing out the outcomes that can be offered through that story.
- Detailed reading of the story to identify the points that should be emphasized and discussed.
- Adapting the story if required.
- Preparing questions to help better comprehension and discussion.
- Planning how to present the story impressively with correct voice modulation and emotional requirement.
- Planning different activities based on the stories to enhance better understanding and thinking.
- Evaluating the activities to check whether identification and internalization takes place.
- Giving a follow up assignment to help the students reduce their stress in other similar situations in their future life and also to help their friends.
Practicing in the class.

- Casual talk between teacher and students and discussed previous days experiences.
- Teacher discussed one of the problems mentioned in the stories and asked the students about their experience.
- Teacher presented the story related to that particular problem.
- Teacher distributed copies of story to the children for their better understanding.
- Comprehensive questions based on stories were asked in order to help children understand the story in a better way and to have discussion on the topic.
- Teacher then clarified the question and doubts regarding the problems in the story with suggestions from the students.
- Teacher then related the problem in the story with similar problems if required.
- Teacher then moved on to the activities in the lesson frame for better identification of students with the characters.
- Teacher moved towards all students and interacts with them in between to collect information from them and to help them. Teacher identified a student with severe problem and suggested further therapies.
- Care should be taken that students never feel that teacher was always trying to find out a problem with them as all the students may not be feeling that particular problem at that particular time.
- Follow up activities such as assignments were given.
It should be kept in mind that teacher and students should take their own time to complete the whole process though there is time schedule. But care should be taken not to extend it for weeks. Each and every day teacher should not tell them new stories for that will be boring and will not yield the required effect. One story per week is enough for the students. The main problems and outcomes offered in the stories were given in Table 7.

Table 7

Main Problems and Outcomes Offered in the Stories

<table>
<thead>
<tr>
<th>Story</th>
<th>Problems Addressed</th>
<th>Stressors</th>
<th>Outcomes Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Let Joe Do it</td>
<td>1. Being put down</td>
<td>Personal</td>
<td>• Developing self esteem</td>
</tr>
<tr>
<td></td>
<td>2. Not feeling valued</td>
<td></td>
<td>• Learning to enjoy what one do</td>
</tr>
<tr>
<td></td>
<td>3. Doubting one self</td>
<td></td>
<td>• Positive self evaluation</td>
</tr>
<tr>
<td></td>
<td>4. Engaging in avoidance behavior</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Facing fears: A Teen Story</td>
<td>• Do not have power to achieve goal</td>
<td>Personal</td>
<td>• Developing power to achieve goal</td>
</tr>
<tr>
<td></td>
<td>• Fear of what one do not know</td>
<td></td>
<td>• Developing willingness to experiment</td>
</tr>
<tr>
<td></td>
<td>• Thinking worst of the situation</td>
<td></td>
<td>• Developing positive thought pattern</td>
</tr>
<tr>
<td></td>
<td>• Reluctant to test reality</td>
<td></td>
<td>• Avoiding false beliefs through reality testing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Learning to control thoughts</td>
</tr>
</tbody>
</table>

Table 7 contd...
<table>
<thead>
<tr>
<th>Story</th>
<th>Problems Addressed</th>
<th>Stressors</th>
<th>Outcomes Offered</th>
</tr>
</thead>
</table>
| 3. Overcoming Adversity: A Teen Story           | • Facing tough times  
• Overcoming difficulties  
• Seeming hopelessness | Personal      | • Developing hardiness  
• Knowing attitudes can determine feelings  
• Knowing that not events, but how we handle the event determines the result. |
| 4. Day to come                                 | • Lack of hopefulness  
• Loneliness  
• Despair  
• Unwillingness to accept what cannot be changed | Home & personal | • Working toward goals  
• Being hopeful and having optimistic thoughts.  
• Looking to change what can change  
• Accepting what cannot be changed. |
| 5. Negotiating A solution                       | • Failure to see parent’s perspective | Home & Peer   | • Helping to have good communication with parents.  
• Helping to find acceptable compromises.  
• Building strategies |

Table 7 contd...
<table>
<thead>
<tr>
<th>Story</th>
<th>Problems Addressed</th>
<th>Stressors</th>
<th>Outcomes Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. New Friends</td>
<td>• Lack of discriminating power</td>
<td>Peer</td>
<td>• Assessing new and old friends.</td>
</tr>
<tr>
<td></td>
<td>• Loss of old friendships</td>
<td></td>
<td>• Taking interest in others.</td>
</tr>
<tr>
<td></td>
<td>• Lack of social skills</td>
<td></td>
<td>• Developing social skills</td>
</tr>
<tr>
<td></td>
<td>• Undesirable friendship</td>
<td></td>
<td>• Decision making</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Overcoming problems with undesirable friendships.</td>
</tr>
<tr>
<td>7. Nailing Down</td>
<td>• Feeling of anger towards peer</td>
<td>Home and</td>
<td>• Anger management</td>
</tr>
<tr>
<td>Anger</td>
<td>• Uncontrollable behaviours.</td>
<td>Peer</td>
<td>• Accepting consequences of behaviour</td>
</tr>
<tr>
<td></td>
<td>• Feelings of powerlumes to change.</td>
<td></td>
<td>• Accepting suggestions from parents</td>
</tr>
<tr>
<td></td>
<td>• Unaware of impact of actions</td>
<td></td>
<td>• Learning about impact of actions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Creating positive alternative.</td>
</tr>
<tr>
<td>8. Finding exceptions to problems</td>
<td>• Issues with peers negative thinking</td>
<td>Peer</td>
<td>• Looking at positives</td>
</tr>
<tr>
<td></td>
<td>• Focusing only on problems</td>
<td></td>
<td>• Seeking solutions</td>
</tr>
<tr>
<td></td>
<td>• Not seeing exceptions</td>
<td></td>
<td>• Finding the exception</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Develop global thinking</td>
</tr>
<tr>
<td>9. Learning to</td>
<td>• Not knowing when a behaviour is appropriate or not</td>
<td>Home</td>
<td>• Making choice about appropriate behaviour</td>
</tr>
<tr>
<td>discriminate</td>
<td>• Confusing about double standards.</td>
<td></td>
<td>• Learning to discriminate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Ownership of behaviour</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Considering needs of other and oneself.</td>
</tr>
</tbody>
</table>

*Table 7 contd...*
<table>
<thead>
<tr>
<th>Story</th>
<th>Problems Addressed</th>
<th>Stressors</th>
<th>Outcomes Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Lack of responsibility</td>
<td></td>
<td>• Learning to face consequences.</td>
</tr>
<tr>
<td></td>
<td>• Telling lies</td>
<td></td>
<td>• Learning to make considered judgement.</td>
</tr>
<tr>
<td></td>
<td>• Lack of good communication with parents.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Lack of knowledge about cause and effect</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Learning About Rules</td>
<td>• Neglecting rules</td>
<td>School</td>
<td>• Explaining values of rules</td>
</tr>
<tr>
<td></td>
<td>• Being disgusted with rules and regulation</td>
<td></td>
<td>• Observing benefits of rules</td>
</tr>
<tr>
<td></td>
<td>• Not knowing the values of restricted freedom.</td>
<td></td>
<td>• Learning the need for school policies.</td>
</tr>
<tr>
<td>12. Tending to the Neglected</td>
<td>• Feeling neglected/uncared.</td>
<td>Peer &amp; Home</td>
<td>• Learning to change what you can</td>
</tr>
<tr>
<td></td>
<td>• Limited choice</td>
<td></td>
<td>• Doing constructive useful things</td>
</tr>
<tr>
<td></td>
<td>• Boredom</td>
<td></td>
<td>• Creating beauty giving others pleasure.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Learning to make a difference</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Considering others.</td>
</tr>
</tbody>
</table>

**Validation of Bibliotherapy Lesson Frame**

Bibliotherapy Lesson Frame was evaluated in each phase of its development. After Bibliotherapy Lesson Frame was finalized it was evaluated using an evaluation proforma. The proforma was developed by
taking into account the following features of the lesson frame, Attractiveness, Appropriateness, Relevance, Applicability and Flexibility.

Attractiveness : It refers to the Attractiveness of the structure of lesson frames, appearance and format.

Appropriateness : It refers to the appropriateness according to age, knowledge level of students.

Relevance : Appropriateness of content of the lesson frames in terms of objectives, needs and purpose.

Applicability : It refers to the extent of students’ involvement in the process and activities.

Flexibility : It refers to the elasticity of the content of the lesson frames.

The investigator prepared 20 items based on the above features. On consultation with experts in the field and supervising teacher, some items were modified and some were rejected. Hence the final form of tool consisted of 17 items. The number of items under each component is given in Table 8.

Table 8

*List of Items in Various Components of Lesson Frame Evaluation Tool*

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Component</th>
<th>Sl. No. of Items</th>
<th>No. of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Attractiveness</td>
<td>7, 8, 9</td>
<td>3</td>
</tr>
<tr>
<td>2.</td>
<td>Appropriateness</td>
<td>1, 6, 10, 13</td>
<td>4</td>
</tr>
<tr>
<td>3.</td>
<td>Relevance</td>
<td>2, 3, 14, 15</td>
<td>4</td>
</tr>
<tr>
<td>4.</td>
<td>Applicability</td>
<td>4, 9, 16, 17</td>
<td>4</td>
</tr>
<tr>
<td>5.</td>
<td>Flexibility</td>
<td>5, 12</td>
<td>2</td>
</tr>
</tbody>
</table>
Administration of lesson frame evaluation tool.

The investigator consulted a total of 15 experts including, Professors, Associate Professors, and Assistant Professors of various universities and colleges, clinical psychologists, higher secondary school teachers and school teachers. The Bibliotherapy Lesson frames and evaluation proforma were given and adequate time was given for filling up the proforma. The responses were collected and analyzed. The panel of experts were given as Appendix IX.

Scoring and Analysis of Bibliotherapy Lesson Frame Evaluation Proforma

The respondents were asked to rate each statement in the tool on a five point scale as Strongly Agree, Agree, Undecided, Disagree and Strongly Disagree. The frequency of different categories of responses for each statement was found and analyzed using chi-square. Test of Significance of each statement in the Proforma using Chi-square test is given in Table 9.
### Table 9

*Test of Significance of Each Statement in the Proforma using Chi-square Test*

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Statements</th>
<th>$\chi^2$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Stories are suitable for the secondary school students</td>
<td>24.08</td>
</tr>
<tr>
<td>2.</td>
<td>Stories include the stressors mentioned</td>
<td>19.83</td>
</tr>
<tr>
<td>3.</td>
<td>Stories are capable of bringing out the outcomes offered</td>
<td>24.08</td>
</tr>
<tr>
<td>4.</td>
<td>The activities and stories are student friendly</td>
<td>19.83</td>
</tr>
<tr>
<td>5.</td>
<td>The whole process in lesson frames are sample</td>
<td>24.08</td>
</tr>
<tr>
<td>6.</td>
<td>The stories enjoyable and interesting</td>
<td>24.08</td>
</tr>
<tr>
<td>7.</td>
<td>Good visual clarity and design</td>
<td>14.83</td>
</tr>
<tr>
<td>8.</td>
<td>The lesson frames are appealing</td>
<td>14.83</td>
</tr>
<tr>
<td>9.</td>
<td>Lesson frame are simple in appearance</td>
<td>24.08</td>
</tr>
<tr>
<td>10.</td>
<td>The activities are interesting and appropriate</td>
<td>24.08</td>
</tr>
<tr>
<td>11.</td>
<td>The lesson frame can be easily transacted in classroom</td>
<td>19.83</td>
</tr>
<tr>
<td>12.</td>
<td>The time limit of the lesson frame are appropriate</td>
<td>19.83</td>
</tr>
<tr>
<td>13.</td>
<td>The lesson frames, are suitable for the problem felt by the students</td>
<td>12.16</td>
</tr>
<tr>
<td>14.</td>
<td>Students stress can be reduced using these stories</td>
<td>19.83</td>
</tr>
<tr>
<td>15.</td>
<td>Student will be interested in hearing these stories</td>
<td>24.08</td>
</tr>
<tr>
<td>16.</td>
<td>Students who are reluctant to participate in stress reducing physical exercises can benefit from this.</td>
<td>19.83</td>
</tr>
<tr>
<td>17.</td>
<td>Teacher can easily apply this in classroom</td>
<td>14.83</td>
</tr>
</tbody>
</table>

The calculated $\chi^2$ value of all statements excluding statements no. 13 of the evaluation tool is significant at 0.01 level. Statement 13 is significant at 0.05 level. Hence it can be interpreted that the bibliotherapy lesson frames satisfied the given criteria. A copy of Bibliotherapy Lesson Frame and its Evaluation Proforma was given as Appendix VII and VIII respectively.
Progressive Relaxation Technique

It has been discovered by Jacobson (1934) that systematically tensing and releasing dozens of muscle groups and by learning to attend to and discriminate between the resulting sensations of tension and relaxation, a person can almost completely eliminate muscle contraction and experience a feeling of deep relaxation. Relaxation training is helpful for students to handle their tensions and stress. Successful training ensures relaxation of unwanted stress and tensions.

Procedure.

A quiet, attractive, spacious atmosphere is required for relaxation training. The environment selected was a smart classroom which can be easily modified for the purpose. The room was sufficiently lighted, with doors and windows closed to avoid sounds from outside. Curtain was used to eliminate sights from outside.

Desks were properly arranged, so that the investigator could give the Progressive Muscle Relaxation at a time for 15 students. The clothing of the students was also considered because they should be comfortable in their dress which should not be very tight or inconvenient. Glasses, watches, shoes and contact lenses were removed prior to relaxation training. The most important objective is providing maximum physical and psychological comfort.

The students were then given a brief account of what is going to be done in that Progressive Muscle Relaxation Training Programme. The students became aware of the rationale behind this Progressive Muscle Relaxation Training. They were given the sequential muscle tensioning and relaxing.
Instructions were given to the students in pleasant audible voice in a way to help all the students hear and understand the instructions. The main procedure is as follows.

The tensing of muscle starts with foot and systematically move up and ends with forehead.

At first the students were asked to take a deep breath through their nose, to hold it for a few seconds and relax. This was done for 4 to 5 times and then they were asked to concentrate on this breath taking. Then they were advised to pay attention to their whole body. Then attending to two more deep breath they were advised to start with their right foot.

- Foot- curl their toes downward so that the foot experience a tension. Hold it for a few seconds… then release it slowly…
- Calf muscles- pull their toes up towards them so that they feel their calf muscle tightened and experience a tension. Now they hold it for a few seconds… then release it slowly so that they can experience the relaxation.
- Then the thigh muscles are squeezed to create a tension and after holding it for a few seconds it is released to feel the relaxation.

These steps were repeated with the left side also.

- Folding finger to make a fist so that tension is felt on the hands and after holding it for a few seconds slowly released to feel the relaxation.
- Then holding the fist forearms are drawn upward towards shoulder to tighten the entire hand muscles. Then after holding it for a few seconds it is released slowly to feel the relaxation.
This same procedure is repeated with the left side also

- Then the buttocks were made to tense by pulling it together. After holding it for a few seconds it was slowly released to feel the relaxation.
- Suck the stomach in, to feel tensed and after holding it for a few seconds released it slowly.
- Tighten the chest by taking a deep breath, holding it for a few seconds and released it slowly.
- Raised the shoulders towards the ears to experience the tension. Held it for a few seconds and released it slowly.
- Bend the head backward and looked up the ceiling to experience tension on neck. Hold it for a few seconds and release it slowly.
- Opened the mouth wide enough to produce tension. After holding it for a few seconds released it slowly.
- Tightly shut the eye lids to experience tension on eyes. After holding it for a few seconds released it slowly.
- Raised the eyebrows as for a possible to feel tension on forehead. After holding it for a few seconds released it slowly.

For doing all these, instructions were given to the students so that they were able to complete the whole process in a sequential flow.

After the process students were asked about their experience. Students were made to share their difficulties and doubts. So that it could be cleared for further training. The whole process took 15-20 minutes. After three days practice students were asked to practice it at home. Training was given continuously for five days then it was given on alternative days.
Progressive Muscle Relaxation Procedure
Statistical Techniques Adopted for the Study

Basic descriptive statistics.

Descriptive Statistics Including Mean, Median, Mode, Standard Deviation, Skewness and Kurtosis corresponding to each variable for Total samples were calculated. The analysis was done mainly to know the nature of distribution of the variable.

Estimation of percentage.

Percentage is a part of whole expressed in hundred. Percentage of sample who prefer to have stress intervention at school was converted into percentage.

Comparison of means.

Test of significance of difference between the mean scores of two experimental groups and control group were calculated to compare the mean pretest, mean post-test scores and mean gain scores between experimental and comparison groups. For large sample.

\[ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}} \]

Where, \( \bar{X}_1 = \) Mean of I group

\( \bar{X}_2 = \) Mean of II group

\( N_1 = \) Number of cases in group I

\( N_2 = \) Number of cases in group II

\( S_1^2 = \) Number of cases in group I

\( S_2^2 = \) Number of cases in group II
For small sample
\[ t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{(N_1 - 1)S_1^2 + (N_2 - 2)S_2^2}{N_1 + N_2 - 2}}} \]

Where, 
\( \bar{X}_1 \) = Mean of group I
\( \bar{X}_2 \) = Mean of group II
\( S_1 \) = Variance of group I
\( S_2 \) = Variance of group II
\( N_1 \) = No. of cares is group I
\( N_2 \) = No. of cares is group II  \( \) (Best & Khan, 2006)

**Analysis of Variance.**

Analysis of variance make it possible to determine whether various mean differ significantly with a single test. Here ANOVA is used to test whether the higher secondary school students different in their Academic Stress.

The calculation of F- involves finding the mean of the deviation from the mean square. Thus between group variance is more commonly referred to as mean square between (MSb) and within group variance is more commonly referred as mean square within (MSw).

Thus for computing F the formula is \[ F = \frac{MS_b}{MS_w} \]

Where  \( MS_b \) in mean squared between

\( MS_w \) is mean squared within

Scheffé Test of Multiple comparison (Ferguson, 1976) was done to compare the relevant category of independent variable in relation to the mean scores of Academic Stress.
ANCOVA.

Single factor ANCOVA is used to study the relative effectiveness of Bibliotherapy and Progressive Muscle Relaxation on Academic Stress after controlling pretest scores as covariate. The experiment was conducted using intact classroom. So the initial status difference has to be removed and for this the investigator employed ANCOVA with the data in order to statistically equate the pre-experimental status of the groups in terms of the selected dependent variables. To carry out ANCOVA procedure the major assumption suggested by Ferguson (1976) was checked.

Bonferroni’s Test of Post-Hoc Comparison was conducted to check whether significant difference exists between the adjusted mean scores after employing ANCOVA.

Effect Size Cohen’s d.

The degree to which the phenomenon is present in the population is represented by Effect Size. It describes the magnitude of the difference between two groups

\[
\text{Cohen’s } d = \frac{\bar{X}_1 - \bar{X}_2}{\text{SD}_p}
\]

where SD pooled = \[
\frac{\text{SD}_{grp1}^2 + \text{SD}_{grp2}^2}{2}
\]

Whether the experimental groups outperformed the control group is calculated using Cohens’ d. Cohen (1988) proposed rules of thumb for interpreting effect size:

- Small effect size is 0.20
- Medium effect size is 0.50
- Large effect size is 0.80

Result and interpretation of the analysis conducted is given in Chapter IV.
Chapter IV

Analysis

- Analysis of Data from Phase One
  - Percentage Analysis
- Analysis of Data from Phase Two
  - Preliminary Analysis
  - Major Analysis
The main thrust of the present study is to determine the effectiveness of Bibliotherapy and Relaxation Exercise on Academic Stress of secondary school students. The investigator analyzed the collected data to examine effectiveness using the statistical techniques such as Test of significance of difference between means, and single factor ANCOVA treating pretest scores as covariate.

In the first phase of the study a survey was conducted among secondary school teachers and secondary school students to find out the percentage of students and teachers who prefer the need for stress reduction intervention in schools. Percentage analysis was the statistical technique used to analyze the collected data.

In addition to this, analysis was done to find out the difference between the means scores of experimental and control groups when Bibliotherapy and Progress Muscle Relaxation were administered.

In the present study analysis of data includes

- Analysis of Data from Phase One
  - Percentage Analysis
- Analysis of Data from Phase Two
  - Preliminary Analysis
  - Major Analysis

Major Analysis includes

- Analysis of Variance
- Mean Difference Analysis
- Analysis of Covariance
Analysis of Data from First Phase of the Study– Survey

First phase of the study included a survey conducted among secondary school students and secondary school teachers. Percentage Analysis was used to analyze the collected data.

Statement-Wise Percentage Calculation

Table 10

*Percentage Analysis of Data to Find out the Views of Teachers on Academic Stress Reduction Programme*

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>% of Yes Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you feel that students have stress?</td>
<td>80</td>
</tr>
<tr>
<td>2</td>
<td>Is there any activity at school to reduce student’s stress?</td>
<td>8</td>
</tr>
<tr>
<td>3</td>
<td>Do you feel that academic stress of students should be reduced?</td>
<td>96</td>
</tr>
<tr>
<td>4</td>
<td>Do you wish to have stress management programmes in your school?</td>
<td>96</td>
</tr>
<tr>
<td>5</td>
<td>Do you like to give stress management activities for students?</td>
<td>100</td>
</tr>
<tr>
<td>6</td>
<td>Do you feel that stress can be reduced through different stress reduction activities?</td>
<td>100</td>
</tr>
<tr>
<td>7</td>
<td>Do you know any stress management programmes or activities?</td>
<td>30</td>
</tr>
<tr>
<td>8</td>
<td>Do you feel that stress management programmes can be effectively given at schools?</td>
<td>96</td>
</tr>
<tr>
<td>9</td>
<td>Do you feel that all students should be given stress management activities?</td>
<td>65</td>
</tr>
<tr>
<td>10</td>
<td>Do you feel that only students having stress should be identified and given such stress reducing programmes?</td>
<td>40</td>
</tr>
<tr>
<td>11</td>
<td>Do you tell stories to your students?</td>
<td>100</td>
</tr>
<tr>
<td>12</td>
<td>Do you feel that stress can be reduced through proper stories?</td>
<td>100</td>
</tr>
<tr>
<td>13</td>
<td>Is it necessary to appoint special trainers to reduce stress among students?</td>
<td>48</td>
</tr>
<tr>
<td>14</td>
<td>Do you feel that teachers can reduce stress among students?</td>
<td>88</td>
</tr>
<tr>
<td>15</td>
<td>Do you feel that students are interested in hearing stories?</td>
<td>92</td>
</tr>
</tbody>
</table>
Discussion.

Teachers views on having stress reduction programmes when converted into percentage showed that majority of the teachers felt that students have stress. The response of teachers revealed that there is no activities in school to reduce the stress of students. Majority of the teachers wished to have stress reduction programmes in the schools. Almost all the teachers felt that stress can be reduced through different stress reduction activities and are willing to give stress management programmes for students.

Most of the teachers do not know any stress reduction programmes. Teachers are confident that stress reduction programmes can be effectively given in schools and most of the teachers responded that all the students should be given stress management activities. Almost all teachers tell stories to their students and are confident that proper stories can reduce stress. Most of the students felt that there is no need for special trainers to give stress reduction programmes as teachers can reduce stress among students. Most of the teachers felt that students are interested in hearing stories.

The analysis and result of data to find out the views of students on Academic Stress Reduction Programme is given in Table 11.
Table 11

Percentage Analysis of Data to Find out the Views of Students on Academic Stress Reduction Programme

<table>
<thead>
<tr>
<th>No.</th>
<th>Statement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do you feel that you have stress?</td>
<td>82</td>
</tr>
<tr>
<td>2</td>
<td>Is there any activities in schools to reduce your stress?</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>Do you feel that stress of students must be reduced?</td>
<td>92</td>
</tr>
<tr>
<td>4</td>
<td>Do you wish to have stress management programmes at school?</td>
<td>95</td>
</tr>
<tr>
<td>5</td>
<td>Do you like to do stress management activities?</td>
<td>97</td>
</tr>
<tr>
<td>6</td>
<td>Do you believe that stress can be reduced through different stress reduction activities?</td>
<td>95</td>
</tr>
<tr>
<td>7</td>
<td>Do you know any stress management programmes or activities?</td>
<td>20</td>
</tr>
<tr>
<td>8</td>
<td>Do you feel that stress management programmes can be effectively given at schools?</td>
<td>65</td>
</tr>
<tr>
<td>9</td>
<td>Do you feel that all students should be included in stress management programmes?</td>
<td>75</td>
</tr>
<tr>
<td>10</td>
<td>Do you feel that only students having stress should be identified and given such stress reducing activities?</td>
<td>20</td>
</tr>
<tr>
<td>11</td>
<td>Do your teachers tell stories in your class?</td>
<td>10</td>
</tr>
<tr>
<td>12</td>
<td>Do you feel that stress can be reduced through proper stories?</td>
<td>74</td>
</tr>
<tr>
<td>13</td>
<td>Is it necessary to appoint special trainers to reduce student’s stress?</td>
<td>61</td>
</tr>
<tr>
<td>14</td>
<td>Do you believe that teachers can reduce student’s stress?</td>
<td>87</td>
</tr>
<tr>
<td>15</td>
<td>Are you interested in hearing stories?</td>
<td>99</td>
</tr>
</tbody>
</table>

Discussion.

Students’ views on having stress reduction programmes were converted into percentage. It showed that most of the students felt stress. Response of students revealed that there is no activities in school to reduce
their stress. Majority of the students wanted to get their stress reduced and to have stress reduction programmes at school. Most of the students’ response revealed their belief that, stress can be reduced through different stress reduction activities.

Most of the students do not know any stress management programmes. Majority of the students believed that Stress Management programmes can be effectively given in schools. Majority of student’s response showed that they wish to have stress reduction programmes for all of them and not prefer giving such programmes only to students who were identified to have stress. Students response revealed that teachers are not telling stories to them. Most of the students believed that proper stories can reduce their stress.

Majority of students felt the need for special trainers to reduce their stress. Most of the students believed that their teachers can reduce their stress and almost all of them are interested in hearing stories.

**Conclusion Derived from Analysis of Phase I**

From the analysis of data obtained from the preliminary survey it can be concluded that almost all the teachers felt that students have stress and want to get it reduced from the schools. Students want stress reduction programme at schools to reduce their stress. Students are interested to hear stories and so the investigator decided to prepare intervention based on stories for one of the experimental group and another stress reducing intervention Progressive Muscle Relaxation exercise (PMR) for other experimental group.
Analysis of Data from Phase 2 - Experimentation

The second phase of the study included experimentation. The samples were selected as Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group. Academic Stress Inventory was administered before and after experimentation for these three groups. The data thus obtained was subjected to preliminary analysis and major analysis.

Preliminary Analysis

The pretest scores and posttest scores of Academic Stress were subjected to statistical analysis for further statistical procedure.

Preliminary analysis of pretest scores.

The scores were tabulated and then the mean, medium, mode, standard deviation, skewness and kurtosis were calculated for total sample and subsample based on gender. The details are given in Table 12, 13 and 14.

Table 12

*Indices for the Pretest Scores of the Dependent Variable for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group (Total sample)*

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>30</td>
<td>169.47</td>
<td>115.50</td>
<td>150</td>
<td>40.14</td>
<td>0.48</td>
<td>-0.49</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>30</td>
<td>170.43</td>
<td>161.00</td>
<td>190</td>
<td>38.56</td>
<td>0.29</td>
<td>-0.76</td>
</tr>
<tr>
<td>Control Group</td>
<td>30</td>
<td>17.70</td>
<td>162.50</td>
<td>180</td>
<td>38.70</td>
<td>0.43</td>
<td>-0.65</td>
</tr>
</tbody>
</table>
Table 13

*Indices of Pretest Scores of the Dependent Variable for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group (Subsample Boys)*

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>180.53</td>
<td>180.00</td>
<td>150</td>
<td>35.06</td>
<td>0.52</td>
<td>-0.05</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>179.47</td>
<td>188.00</td>
<td>190</td>
<td>32.53</td>
<td>0.10</td>
<td>-0.36</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>180.73</td>
<td>180.00</td>
<td>155</td>
<td>34.10</td>
<td>0.41</td>
<td>-0.47</td>
</tr>
</tbody>
</table>

Table 14

*Indices of Pretest Scores of the Dependent Variable for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group (Subsample Girls)*

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>158.40</td>
<td>153.00</td>
<td>105</td>
<td>43.02</td>
<td>0.88</td>
<td><strong>0.00</strong></td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>161.40</td>
<td>148.00</td>
<td>105</td>
<td>42.97</td>
<td>0.74</td>
<td>-0.44</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>160.67</td>
<td>148.00</td>
<td>148</td>
<td>41.51</td>
<td>0.86</td>
<td>-0.11</td>
</tr>
</tbody>
</table>

The P.P. Plot of the pretest scores of the academic stress for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for total sample and subsample boys and girls are presented in figure 2 to 10. These figures show that the variable follows properties of normal curve.
Figure 2. P.P. Plot of the pretest scores of the Bibliotherapy Group for total sample.

Figure 3. P.P. Plot of the pretest scores of the Progressive Muscle Relaxation Group for total sample.
Figure 4. P.P. Plot of the pretest scores of the Control Group for total sample.

Figure 5. P.P. Plot of the pretest scores of the Bibliotherapy Group for subsample boys
Figure 6. P.P. Plot of the pretest scores of the Progressive Muscle Relaxation Group for subsample boys

Figure 7. P.P. Plot of the pretest scores of the Control Group for subsample boys
Figure 8. P.P. Plot of the pretest scores of the Bibliotherapy Group for subsample girls

Figure 9. P.P. Plot of the pretest scores of the Progressive Muscle Relaxation Group for subsample girls
Figure 10. P.P. Plot of the pretest scores of the Control Group for subsample girls

Discussion.

The tables 12 to 14 clearly show that the arithmetic mean, median and mode of the scores of Academic Stress of two Experimental Groups and the Control Group are almost the same for total sample and subsample based on gender. The mean score of Academic Stress was higher than the scale average 156 for the two Experimental Group and subsample based on gender.

This implies that the students are with High Academic Stress. The standard deviation of academic stress scale for two Experimental Group, and Control Group for total sample and subsamples boys and girls indicates that scores are somewhat dispersed from the central value. The values of skewness and kurtosis of Academic Stress Scores for Bibliotherapy Group, Progressive
Muscle Relaxation Group and Control Group for total sample and subsamples indicated that distributions are approximately normal. Thus by analyzing the values of measures of central tendency and dispersion of scores of Academic Stress for experiment group I, Progressive Muscle Relaxation Group and Control Group for total sample and subsamples, it can be inferred that the level of Academic Stress was high for secondary school students before the treatment.

**Preliminary Analysis of Posttest Scores**

Posttest scores of Academic Stress of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for total sample and subsample boys and girls were tabulated and then the mean, median, mode, standard deviation, skewness and kurtosis were calculated. The details are given in Table 15, 16 and 17.

Table 15

*Indices Posttest Scores of the Variable for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group (Total sample)*

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>30</td>
<td>96.40</td>
<td>90.00</td>
<td>90</td>
<td>20.83</td>
<td>1.77</td>
<td>3.95</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>30</td>
<td>123.13</td>
<td>115.50</td>
<td>89</td>
<td>33.15</td>
<td>1.01</td>
<td>0.14</td>
</tr>
<tr>
<td>Control Group</td>
<td>30</td>
<td>169.80</td>
<td>162.50</td>
<td>150</td>
<td>39.56</td>
<td>0.51</td>
<td>0.52</td>
</tr>
</tbody>
</table>
Table 16

Indices of Posttest Scores of the Variable for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group (Subsample Boys)

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>103.67</td>
<td>100.00</td>
<td>90</td>
<td>25.80</td>
<td>1.28</td>
<td>1.38</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>142.33</td>
<td>134.00</td>
<td>89</td>
<td>35.41</td>
<td>0.28</td>
<td>1.19</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>180.27</td>
<td>180.00</td>
<td>150</td>
<td>35.27</td>
<td>0.46</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Table 17

Indices of Posttest Scores of Dependent Variable for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group (Subsample Girls)

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>Mode</th>
<th>S.D.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>89.13</td>
<td>90.00</td>
<td>90.00</td>
<td>10.98</td>
<td>0.07</td>
<td>-1.33</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>103.93</td>
<td>100.00</td>
<td>82.00</td>
<td>15.27</td>
<td>0.38</td>
<td>-1.00</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>159.33</td>
<td>149.00</td>
<td>110</td>
<td>41.99</td>
<td>0.92</td>
<td>0.17</td>
</tr>
</tbody>
</table>

The P.P. Plot of the posttest scores of the academic stress for Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for total sample and subsample boys and girls are presented in figure 11 to 19. These figures show that the variable follows properties of normal curve.
Figure 11. P.P. Plot of the posttest scores of the Bibliotherapy Group for total sample.

Figure 12. P.P. Plot of the posttest scores of the Progressive Muscle Relaxation Group for total sample.
Figure 13. P.P. Plot of the posttest scores of the Control Group for total sample.

Figure 14. P.P. Plot of the posttest scores of the Bibliotherapy Group for subsample boys
Figure 15. P.P. Plot of the posttest scores of the Progressive Muscle Relaxation Group for subsample boys

Figure 16. P.P. Plot of the posttest scores of the Control Group for subsample boys
Figure 17. P.P. Plot of the posttest scores of the Bibliotherapy Group for subsample girls

Figure 18. P.P. Plot of the posttest scores of the Progressive Muscle Relaxation Group for subsample girls
Analysis

Figure 19. P.P. Plot of the posttest scores of the Control Group for subsample girls

**Discussion.**

The tables 15 to 17 clearly show that the arithmetic mean, mean, median and mode of the scores of Academic stress of the Experimental Groups are not having much difference. The mean scores of Academic Stress of the Experimental Groups are below the scale average 156, for the total sample and subsamples. This implies that the level of Academic Stress of secondary school students reduced after the intervention. The standard deviation of Academic Stress scores for Bibliotherapy Group indicates that scores are somewhat dispersed from the centered value. The values of skewness and kurtosis of the distributions of Academic Stress of both Experimental Groups for total sample and subsamples indicate that all distributions are approximately normal. Thus by analyzing the values of
measures of central tendency and dispersion of the scores of Academic stress of Bibliotherapy Group and Progressive Muscle Relaxation Group, for total sample and subsamples, it can be inferred that the level of Academic Stress of the students after giving Bibliotherapy and Relaxation Exercise has lowered to a very low level.

Tables 15 to 17 clearly show that the arithmetic mean, median and mode of the Academic Stress scores of the Control Group are not having much difference. The mean score of Academic Stress of the comparison group are above the scale Average 156 for total sample and subsamples. This implies that the level of Academic Stress of students has not changed considerably. The standard deviation of Academic Stress indicates that scores are somewhat dispersed from central value. The values of skewness and kurtosis of the distribution of Academic Stress for Total sample and subsamples indicates that all distributions are approximately normal. Thus by analyzing the values of measures of central tendency for total sample and subsamples, it can be inferred that the level of Academic Stress for Total sample and subsamples of Control Group has not changed considerably.

**Major Analysis**

In the present study mean difference analysis was conducted to compare the mean pretest scores and posttest scores of two Experimental Groups and Control Group. Difference in mean gain scores between two Experimental Groups and Control Groups on Academic Stress were also investigated. To test the effectiveness of the intervention the mean pretest and mean posttest scores of Bibliotherapy Group, Progressive Muscle Relaxation
Group and Control Group for Total sample and subsample boys and girls were investigated. The ‘t’ value using paired t test was calculated and tested for significance.

**Pre-experimental status of experimental groups and control group.**

In order to compare the mean pretest scores of Academic Stress of secondary school students of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for Total sample and subsamples, the significance of difference between mean values of these groups was found out by calculating the F-ratio using Analysis of Variance (ANOVA). The details are given in Tables 18 to 20.

Table 18

*Summary of ANOVA of Academic Stress Scores for Total Sample.*

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>25.27</td>
<td>2</td>
<td>12.63</td>
<td>0.008</td>
</tr>
<tr>
<td>Within groups</td>
<td>133275.13</td>
<td>87</td>
<td>1531.90</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>133300.41</td>
<td>89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 18 shows Analysis of Variance conducted to compare the pretest mean academic stress scores of students in the three different groups viz., Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group for total sample. There was no significant difference in the scores of Academic Stress, F (2, 87) = 0.008, P > 0.05. These results suggested that experimental and control groups were not significantly different in their Academic Stress before giving the interventions.
Table 19

**Summary of ANOVA of Academic Stress Scores of Boys**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>13.91</td>
<td>2</td>
<td>6.96</td>
<td>0.006</td>
</tr>
<tr>
<td>Within groups</td>
<td>48252.40</td>
<td>42</td>
<td>11148.87</td>
<td>0.006</td>
</tr>
<tr>
<td>Total</td>
<td>48266.31</td>
<td>44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 19 shows that Analysis of Variance conducted to compare the pretest mean academic stress scores of students in the three different groups viz., Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group for subsample boys. There was no significant difference in the scores of Academic Stress, $F(2, 42) = 0.006$, $P > 0.05$. These results suggested that experimental and control groups for boys were not significantly different in their Academic Stress before giving the interventions.

Table 20

**Summary of ANOVA of Academic Stress Scores of Girls**

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>73.38</td>
<td>2</td>
<td>36.69</td>
<td></td>
</tr>
<tr>
<td>Within groups</td>
<td>75880.53</td>
<td>42</td>
<td>1806.68</td>
<td>0.020</td>
</tr>
<tr>
<td>Total</td>
<td>75953.91</td>
<td>44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 20 shows that Analysis of Variance conducted to compare the pretest mean academic stress scores of students in the three different groups viz., Bibliotherapy Group, Progressive Muscle Relaxation Group and Control
group for subsample girls. There was no significant difference in the scores of Academic Stress, $F(2, 42) = 0.020, P > 0.05$. These results suggested that experimental and control groups for girls were not significantly different in their Academic Stress before giving the interventions.

**Discussion.**

Result of the ANOVA performed to estimate the significance of difference between mean pretest scores of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group showed that there was no significant difference between the pretest scores of the three groups in the Academic Stress. This reveals that the three groups are almost equal in their Academic Stress.

**Comparison of mean posttest scores of Academic Stress of Experimental and Control Group.**

Details of the F-ratio calculated using ANOVA for the three groups for total sample and subsample was given in Tables 20 to 24.

Table 21

*Summary of ANOVA of Academic Stress Scores of Secondary School Students for Total Sample*

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>82800.09</td>
<td>2</td>
<td>41400.04</td>
<td>40.088**</td>
</tr>
<tr>
<td>Within groups</td>
<td>89847.47</td>
<td>87</td>
<td>1032.73</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>172647.56</td>
<td>89</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** P< .01
Table 21 shows Analysis of Variance conducted to compare the posttest mean scores of Academic Stress of Students in the three different groups for total sample. There was significant difference in the scores of Academic Stress, \( F(2, 87) = 40.088, P<0.01 \). The result suggested that experimental and control group significantly differ in their Academic Stress after giving the intervention.

In order to know which groups differ in their mean posttest score of Academic Stress, the data was further analyzed with the help of Scheffe’s test of post hoc comparison and the result is given in Table 22.

Table 22

*Summary of Scheffe’s Test of Post-hoc Comparison with Matrix of Ordered Means of Academic Stress for Total sample*

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Score</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>96.40</td>
<td>0.00</td>
<td>26.73**</td>
<td>73.40**</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>123.13</td>
<td></td>
<td>0.00</td>
<td>46.67**</td>
</tr>
<tr>
<td>Control Group</td>
<td>169.80</td>
<td>73.40**</td>
<td>46.67**</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* P< .05  ** P< .01

Table 22 shows that the difference between mean posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group is 26.73 were \( F = 10.38, P<0.01 \). The difference between mean scores of Bibliotherapy Group and Control Group is 73.40 where \( F=78.32, P<0.01 \). The difference between Progressive Muscle Relaxation Group and Control Group was 46.67 where \( F = 31.69, P<0.01 \). From the result it can be concluded that the
difference between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group is highly significant for the Total sample.

Details of the F ratio calculated using ANOVA for the three groups for subsample Boys was given Table 23

Table 23

Summary of ANOVA of Academic Stress Scores of Secondary School Students for Boys

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Square</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between group</td>
<td>44008.04</td>
<td>2</td>
<td>22004.02</td>
<td>20.87**</td>
</tr>
<tr>
<td>Within group</td>
<td>44281.60</td>
<td>42</td>
<td>1054.32</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>88289.64</td>
<td>44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** P<.01

Table 23 shows Analysis of Variance conducted to compare the posttest mean scores of Academic Stress of Students in the three different groups for subsample Boys. There was significant difference in the scores of Academic Stress, F (2,42)=20.87, P<0.01. The result suggested that experimental and control group for subsample boys significantly differ in their Academic Stress after giving the intervention.

In order to know which groups differ in their mean posttest score of Academic Stress, the data was further analyzed with the help of Scheffe’s test of post hoc comparison and the result is given in Table 24.
Table 24

Summary of Scheffe’s Test of Post-hoc Comparison with Matrix of Ordered Means of Academic Stress for Subsample Boys

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean score</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>103.67</td>
<td>0.00</td>
<td>38.67**</td>
<td>76.60**</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>142.33</td>
<td>38.67**</td>
<td>0.00</td>
<td>37.93**</td>
</tr>
<tr>
<td>Control Group</td>
<td>180.27</td>
<td>76.60**</td>
<td>37.93**</td>
<td>0.00</td>
</tr>
</tbody>
</table>

** P<.01

Table 24 shows that the difference between mean scores of Bibliotherapy Group and Progressive Muscle Relaxation Group is 38.67 where F= 21.72, P< .01. The difference between mean scores of Bibliotherapy Group and Control Group is 76.60 where F= 85.38, P< .01. The difference between mean scores of Progressive Muscle Relaxation Group and Control Group is 37.93 where F=21.07, P< .01. From the result it can be concluded that the difference between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group is highly significant for subsample Boys.

Details of F ratio calculated using ANOVA for the three groups for subsample Girls was given in Table 25.
Table 25

*Summary of ANOVA of Academic Stress Scores of Girls.*

<table>
<thead>
<tr>
<th>Source</th>
<th>Sum of Square</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between group</td>
<td>41081.20</td>
<td>2</td>
<td>20540.60</td>
<td>29.110**</td>
</tr>
<tr>
<td>Within group</td>
<td>29636.00</td>
<td>42</td>
<td>705.62</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>70717.20</td>
<td>44</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** P<.01

Table 25 shows Analysis of Variance conducted to compare the posttest mean scores of Academic Stress of Students in the three different groups for subsample Girls. There was significant difference in the scores of Academic Stress, F (2, 42)=29.110, P<0.01. The result suggested that experimental and control group for subsample Girls significantly differ in their Academic Stress after giving the intervention.

In order to know which groups differ in their mean posttest score of Academic Stress, the data was further analyzed with the help of Scheffe’s test of post hoc comparison and the result is given in Table 26.

Table 26

*Summary of Scheffe’s Test of Post Hoc Comparison with matrix of ordered means of Academic Stress for Girls.*

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean score</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>89.13</td>
<td>103.93</td>
<td>159.93</td>
</tr>
<tr>
<td>Bibliotherapy Group</td>
<td>89.13</td>
<td>0.00</td>
<td>14.80*</td>
<td>70.20**</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>103.93</td>
<td>14.80*</td>
<td>0.00</td>
<td>55.40**</td>
</tr>
<tr>
<td>Control Group</td>
<td>159.93</td>
<td>70.20**</td>
<td>55.40**</td>
<td>0.00</td>
</tr>
</tbody>
</table>

* P<.05  ** P<.01
Table 26 shows that the difference between mean scores of Bibliotherapy Group and Progressive Muscle Relaxation Group is 14.80 where $F = 3.20$, $P<0.05$. The difference between mean scores of Bibliotherapy Group and Control Group is 70.20 where $F=71.74$, $P<.01$. The difference between mean scores of Progressive Muscle Relaxation Group and Control Group is 55.40 where $F=44.62$, $P<.01$. From the result it can be concluded that the difference between Bibliotherapy Group and Control Group and Progressive Muscle Relaxation Group and Control Group are more significant than Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample girls.

**Discussion of Results**

Result of ANOVA performed to estimate difference between posttest scores of Bibliotherapy Group and Control Group after intervention showed that all the three groups differ significantly in the mean posttest score of Academic Stress for total sample and subsample Boys and Girls. Scheffe’s test of Post hoc comparison showed that the difference was the result of difference in the mean scores of all the three groups. That is the Experimental Group given Bibliotherapy, Experimental Group given Progressive Muscle Relaxation and Control group given no intervention differed significantly in their posttest mean scores.

**Group wise comparison of mean pretest scores of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for total sample and subsamples.**

To study whether the Experimental Groups (Bibliotherapy Group and Progressive Muscle Relaxation Group), Bibliotherapy Group and Control
Group and Progressive Muscle Relaxation Group and Control Group differ significantly in their mean pretest scores of Academic Stress for Total sample when test of significance of difference between two independent groups was applied. The means and standard deviation of the pretest scores of Academic Stress of the three groups for total sample and subsample were subjected to mean difference analysis.

Result of the test of significance of difference between mean pretest scores is given in Table 27.

Table 27

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>30</td>
<td>169.47</td>
<td>40.14</td>
<td>0.10</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>30</td>
<td>170.43</td>
<td>38.56</td>
<td></td>
</tr>
<tr>
<td>Bibliotherapy Group</td>
<td>30</td>
<td>169.47</td>
<td>40.14</td>
<td>0.12</td>
</tr>
<tr>
<td>Control Group</td>
<td>30</td>
<td>170.70</td>
<td>38.70</td>
<td></td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>30</td>
<td>170.43</td>
<td>38.56</td>
<td>0.03</td>
</tr>
<tr>
<td>Control Group</td>
<td>30</td>
<td>170.70</td>
<td>38.70</td>
<td></td>
</tr>
</tbody>
</table>

Table 27 shows the result of t-test conducted to compare the Academic Stress mean scores between experimental groups and control group prior to the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for total sample. There was no significant difference in the mean pretest scores of Academic Stress of Bibliotherapy Group (M= 169.47, SD = 40.14) and Progressive Muscle Relaxation Group (M=170.43, SD = 38.56);
t (58) = 0.10, P>.05. These results suggested that the Bibliotherapy Group and Progressive Muscle Relaxation Group were not significantly different in their Academic Stress before giving the intervention. Result is presented in Figure 20.

The result is presented in Figure 20.

![Figure 20](image)

*Figure 20. Pretest mean scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation (PMR) Group for total sample.*

The graphical representation of mean pretest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Table 27 shows the result of t-test conducted to compare the Academic Stress mean scores between Bibliotherapy Group and Control Group prior to the administration of Bibliotherapy for total sample. There was no significant difference in the mean pretest scores of Academic Stress of Bibliotherapy
Analysis

Group (M= 169.47, SD = 40.14) and Control Group (M=170.70, SD = 38.70); t (58) = 0.12, P>.05. This means that the pre-experimental status of subjects in Bibliotherapy Group and Control Group are not significantly different in their Academic Stress before giving the intervention. Result is presented in Figure 21.

The result is presented in figure 21.

![Figure 21. Pretest Mean Scores of Academic Stress of Bibliotherapy Group and Control Group for total sample.](image)

The graphical representation of mean pretest scores of Academic Stress of Bibliotherapy Group and Control Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Table 27 shows the t-test conducted to compare the Academic Stress mean scores between Progressive Muscle Relaxation Group and Control Group prior to the administration of Progressive Muscle Relaxation Exercise
for total sample. There was no significant difference in the mean pretest scores of Academic Stress of Progressive Muscle Relaxation Group (M=170.43, SD = 38.56) and Control Group (M=170.70, SD = 38.70); t (58) = 0.03, P>.05. This means that the pre-experimental status of subjects in Progressive Muscle Relaxation Group and Control Group are not significantly different in their Academic Stress before giving the intervention.

The result is presented in the figure 22.

![Graph](image)

*Figure 22. Pretest means scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for total sample.*

The graphical representation of mean pretest scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Data and Results of the t-test for subsample Boys are given in Table 28.
Table 28

Test of Significance of difference in Mean Pretest Scores of Academic Stress for Subsample Boys

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>180.53</td>
<td>35.00</td>
<td>0.86</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>179.47</td>
<td>32.53</td>
<td></td>
</tr>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>180.53</td>
<td>35.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>180.73</td>
<td>34.10</td>
<td></td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>179.47</td>
<td>32.53</td>
<td>0.10</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>180.73</td>
<td>34.10</td>
<td></td>
</tr>
</tbody>
</table>

Table 28 shows that the results of t-test conducted to compare the Academic Stress mean scores between Bibliotherapy and Progressive Muscle Relaxation Group prior to the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for subsample Boys. There was no significant difference in the mean pretest scores of Academic Stress of Bibliotherapy Group (M= 180.53, SD = 35) and Progressive Muscle Relaxation Group (M=179.47, SD = 32.53); t (28) = 0.86, P>.05. These results suggested that the Bibliotherapy Group and Progressive Muscle Relaxation Group were not significantly different in their Academic Stress before giving the intervention.

The result is presented in Figure 23.
Figure 23. Pretest mean scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation (PMR) Group for subsample Boys.

The graphical representation of mean pretest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Table 28 shows that the results of t-test conducted to compare the Academic Stress mean scores between Bibliotherapy Group and Control Group prior to the administration of Bibliotherapy for subsample Boys. There was no significant difference in the mean pretest scores of Academic Stress of Bibliotherapy Group (M= 180.53, SD = 35) and Control Group (M=180.73, SD=34.1); t (28) = 0.02, P>.05. These results suggested that the Bibliotherapy Group and Control Group were not significantly different in their Academic Stress before giving the intervention.

The result is presented in Figure 24.
Figure 24. Pretest Mean Scores of Academic Stress of Bibliotherapy Group and Control Group for subsample boys.

The graphical representation of mean pretest scores of Academic Stress of Bibliotherapy Group and Control Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Table 28 shows that the result of t-test conducted to compare the Academic Stress mean scores between Progressive Muscle Relaxation Group and Control Group prior to the administration of Progressive Muscle Relaxation Exercise for subsample Boys. There was no significant difference in the mean pretest scores of Academic Stress of Progressive Muscle Relaxation Group (M=179.47, SD = 32.53) and Control Group (M=180.73, SD = 34.1); t(28) = 0.10, P>.05. These results suggested that the Progressive Muscle Relaxation Group and Control Group were not significantly different in their Academic Stress before giving the intervention.
The result is presented in the Figure 2

![Graphical representation showing pretest scores for Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for subsample Boys.](image)

*Figure 25. Pretest scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for subsample Boys.*

The graphical representation of Mean pretest scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

**Group wise comparison of mean pretest scores of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for subsample Girls.**

Data and results of the t-test for subsample Girls is given in Table 2.
Table 29

Test of Significance of Difference in Mean Pretest Scores of Academic Stress between Different Groups for Subsample Girls

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>15</td>
<td>158.40</td>
<td>43.02</td>
<td>0.19</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>161.40</td>
<td>42.97</td>
<td></td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>160.67</td>
<td>41.51</td>
<td>0.15</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>15</td>
<td>161.40</td>
<td>42.97</td>
<td>0.05</td>
</tr>
<tr>
<td>Control Group</td>
<td>15</td>
<td>160.67</td>
<td>41.51</td>
<td></td>
</tr>
</tbody>
</table>

Table 29 shows the results of t-test conducted to compare the Academic Stress mean scores between Bibliotherapy Group and Progressive Muscle Relaxation Group prior to the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for subsample Girls. There was no significant difference in the mean pretest scores of Academic Stress of Bibliotherapy Group (M= 158.40, SD = 43.02) and Progressive Muscle Relaxation Group (M=161.40, SD = 42.97); t (28) = 0.19, P>.05. These results suggested that the Bibliotherapy Group and Progressive Muscle Relaxation Group were not significantly different in their Academic Stress before giving the intervention.

The result is presented in the Figure 26.
Figure 26. Pretest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation (PMR) Group for subsample Girls.

The graphical representation of Mean Pretest Scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Table 29 shows the results of t-test conducted to compare the Academic Stress mean scores between Bibliotherapy Group and Control Group prior to the administration of Bibliotherapy for subsample Girls. There was no significant difference in the mean pretest scores of Academic Stress of Bibliotherapy Group (M=158.40, SD = 43.02) and Control Group (M=160.67, SD=41.51); t (28)=0.15, P>.05. These results suggested that the Bibliotherapy Group and Control Group were not significantly different in their Academic Stress before giving the intervention.

The result is presented in the Figure 27.
Figure 27. Pretest Scores of Academic Stress of Bibliotherapy Group and Control Group for subsample Girls.

The graphical representation of Mean Pretest scores of Academic Stress of Bibliotherapy Group and Control Group shows that these two groups are similar to certain extent. The graphical observation confirms the result of mean difference analysis.

Table 29 shows the results of t-test conducted to compare the Academic Stress mean scores between Progressive Muscle Relaxation Group and Control Group prior to the administration of Progressive Muscle Relaxation Exercise for subsample Girls. There was no significant difference in the mean pretest scores of Academic Stress of Progressive Muscle Relaxation Group (M=161.40, SD = 42.97) and Control Group (M=160.67, SD = 41.51); t(28)=0.05, P>.05. These results suggested that the Progressive Muscle Relaxation Group and Control Group were not significantly different in their Academic Stress before giving the intervention.
The result is presented in Figure 28

![Bar graph showing pretest scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for subsample girls.](image)

**Figure 28.** Pretest scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for subsample girls.

The graphical representation of Mean Pretest scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group shows that these two groups are similar. The graphical observation confirms the result of mean difference analysis.

**Discussion**

The result of test of significance of means conducted for group wise comparison of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group shows that all the groups do not differ in their mean pretest scores when compared group wise for total sample and subsample. There exists no significant difference in mean pretest scores of Experimental Group given Bibliotherapy, and Experimental Group given Progressive Muscle Relaxation for total sample and subsample. There exist no significant difference in the mean pretest scores of Experimental Group given Bibliotherapy and Control Group given no intervention and also there exist no
significant difference in mean pretest scores of Experimental Group given Progressive Muscle Relaxation and Control Group given no intervention for total sample and subsamples.

**Testing the effectiveness of Bibliotherapy and Progressive Muscle Relaxation Exercise on Academic Stress of selected sample.**

The comparison of mean scores between pretest and posttest scores of Academic Stress of secondary school students in the Bibliotherapy Group for the Total sample and subsample Boys and Girls were found out. The ‘t’ value using paired t test was calculated and tested for significance.

**Comparison of mean pretest and posttest scores of Academic Stress of Bibliotherapy Group for total sample.**

The effectiveness of Bibliotherapy in the Academic Stress of students in the Bibliotherapy Group was found out by computing the ‘t’ value using paired t test. It was then tested for significance. The consolidated results of the test of significance of difference between mean pretest and mean posttest scores of Academic stress of the Total sample in Bibliotherapy Group is given in Table 30.

Table 30

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>SD₁</td>
<td>M₂</td>
</tr>
<tr>
<td>Bibliotherapy</td>
<td>30</td>
<td>169.47</td>
<td>40.14</td>
<td>96.40</td>
</tr>
</tbody>
</table>

** P<.01
Table 30 provides the comparison of mean scores of Academic Stress between the pretest and posttest scores of Bibliotherapy Group for the Total sample. The mean pretest scores (M=169.47, SD=40.14) is significantly greater than the mean posttest scores (M=96.40, SD=20.83); t (29) = 13.50, P<0.01. Hence it is clear that there is significant difference between mean pretest and mean posttest score on Academic Stress of students in Bibliotherapy Group. The posttest mean score is significantly lower than the pretest mean score. This clearly proves that Bibliotherapy is highly effective in reducing the Academic Stress of secondary school students. The results are represented graphically in Figure 29.

![Figure 29. Comparison of mean pretest and mean posttest scores of Academic Stress of Bibliotherapy Group for total sample](image)

The graphical representation of Mean Pretest and Posttest scores of Academic Stress of Bibliotherapy Group for total sample shows that the performance of students in the two tests are dissimilar. Posttest mean scores is lower than pretest mean score of Experimental Group for academic stress. The graphical observation confirms the result of Mean Difference Analysis.
Comparison of mean pretest and posttest scores of Academic Stress of Bibliotherapy group for boys.

To study the effectiveness of Bibliotherapy on the Academic Stress of students in the Bibliotherapy Group for subsample boys paired ‘t’ test was used.

The consolidated results of the test of significance of difference between mean pretest and posttest scores of Academic Stress of Bibliotherapy Group for Boys is given in Table 31.

Table 31

Test of Significance of Difference between Mean Pretest and Mean Posttest Scores of Academic Stress of Boys.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>SD₁</td>
<td>M₂</td>
</tr>
<tr>
<td>Bibliotherapy</td>
<td>15</td>
<td>180.53</td>
<td>35.00</td>
<td>103.67</td>
</tr>
</tbody>
</table>

**P<.01

Table 31 provides the comparison of mean scores of Academic Stress between the pretest and posttest scores of Bibliotherapy Group for subsample boys. The mean pretest scores (M=180.53, SD=35) is significantly greater than the mean posttest scores (M=103.67, SD=25.80); t (14) = 12.32, P<0.01. Hence it is clear that there is significant difference between mean pretest and mean posttest scores of Academic Stress of students in Bibliotherapy Group. The posttest score is significantly lower than the pretest mean scores. This
clearly proves that Bibliotherapy is highly effective in reducing the Academic Stress of secondary school students. The results are represented graphically in Figure 30.

![Figure 30](image)

*Figure 30.* Comparison of Mean Pretest and Mean Posttest Scores of Academic Stress of Bibliotherapy Group for Subsample Boys.

The graphical representation of mean pretest and posttest scores of Academic Stress of Bibliotherapy Group for subsample boys shows that the performance of students are dissimilar. The posttest mean score is less than pretest mean score of Bibliotherapy Group for Academic Stress. The Graphical observation confirms the results of Mean Difference Analysis.

**Comparison of mean pretest and posttest scores of Academic Stress of Bibliotherapy Group for subsample girls.**

The effectiveness of Bibliotherapy in the Academic Stress of students in the Bibliotherapy Group was found out by computing the ‘t’ value using paired ‘t’ test. It was then tested for significance.
The consolidated results of the test of significance of difference between mean pretest and posttest scores of Academic Stress of Experimental Group for subsample Girls is given in Table 32.

Table 32

Result of Test of Significance of Difference between Mean Pretest and Mean Posttest Scores of Academic Stress of Bibliotherapy Group for Girls.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th></th>
<th>Posttest</th>
<th></th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>SD₁</td>
<td>M₂</td>
<td>SD₂</td>
<td></td>
</tr>
<tr>
<td>Bibliotherapy</td>
<td>15</td>
<td>158.40</td>
<td>43.02</td>
<td>89.13</td>
<td>10.98</td>
<td>7.73**</td>
</tr>
</tbody>
</table>

**P<.01

Table 32 provides the comparison of mean scores of Academic Stress between the pretest and posttest scores of Bibliotherapy Group for subsample girls. The mean pretest scores (M=158.40, SD=43.02) is significantly greater than the mean posttest scores (M=89.13, SD=10.98); t (14) = 7.73, P<.01. Hence it is clear that there is significant difference between mean pretest and mean posttest scores of Academic Stress of students in Bibliotherapy Group. The posttest mean score is significantly lower than the pretest mean score. This clearly proves that Bibliotherapy is highly effective in reducing the Academic Stress of secondary school students. The results are represented graphically in Figure 31.
Figure 31. Comparison of mean pretest and mean posttest scores of Academic Stress of Bibliotherapy Group for subsample girls.

The graphical representation of mean pretest and posttest scores of Academic Stress of Bibliotherapy Group for subsample Girls shows that the performance of students are dissimilar. Posttest mean score is less than pretest mean scores of Bibliotherapy Group for Academic Stress. The graphical observation confirms the results of Mean Difference Analysis.

Discussion

Results of test of significance of difference between mean pretest and post scores of Bibliotherapy for total sample and subsample showed that there exist significant difference in the mean pretest and posttest scores. The mean posttest scores were significantly lower than the mean pretest scores of experimental group given Bibliotherapy for total sample and subsample. This reveals that Bibliotherapy is effective in reducing the Academic Stress of students.
**Comparison of Mean Pretest and Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group for Total sample**

The effectiveness of Relaxation Exercise in the Academic Stress of students in the Progressive Muscle Relaxation Group was found out by computing ‘t’ value using paired ‘t’ test. It was then tested for significance.

The consolidated result of the test of significance of difference between mean pretest and posttest scores of Academic Stress of Progressive Muscle Relaxation Group for total sample is given in Table 33.

Table 33

*Test of Significance of Difference between Mean Pretest and Mean Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group for Total Sample*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁ SD₁</td>
<td>M₂ SD₂</td>
<td></td>
</tr>
<tr>
<td>Progressive Muscle Relaxation</td>
<td>30</td>
<td>170.43 38.56</td>
<td>123.13 33.15</td>
<td>7.12**</td>
</tr>
</tbody>
</table>

**P<.01**

Table 33 provides the comparison of mean scores of Academic Stress between the pretest and posttest scores of Progressive Muscle Relaxation Group for the Total sample. The mean pretest scores (M=170.43, SD=38.56) is significantly greater than the mean posttest scores (M=123.13, SD=33.15); t (29) = 7.12, P<0.01. Hence it is clear that there is significant difference between mean pretest and mean posttest score on Academic Stress of students in Progressive Muscle Relaxation Group. The mean posttest score is significantly lower than the mean pretest score. This clearly proves that
Progressive Muscle Relaxation exercise is effective in reducing the Academic Stress of secondary school students. The results are represented graphically in Figure 32.

![Graph showing comparison of pretest and posttest scores of Academic Stress in Progressive Muscle Relaxation Group for total sample.](image-url)

**Figure 32.** Comparison of mean pretest and posttest scores of Academic stress of Progressive Muscle Relaxation Group for total sample

The Graphical representation of Mean pretest and mean posttest scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group for Total sample shows that the performance in the two tests are dissimilar. Mean posttest score is lower than mean pretest score of Progressive Muscle Relaxation Group for Academic Stress. The graphical observation confirms the results of Mean Difference Analysis.

**Comparison of mean pretest and posttest scores of Academic Stress of Progressive Muscle Relaxation Group for subsample boys.**

The effectiveness of progressive muscle relaxation in reducing the Academic Stress of Students in Progressive Muscle Relaxation Group was
found out by computing the ‘t’ value using paired ‘t’ test. It was then tested for significance.

The consolidated result of the test of the significance of difference between mean pretest and posttest scores of Academic Stress of Progressive Muscle Relaxation Group for subsample Boys is given in Table 34.

Table 34

*Test of Significance of Difference between Mean Pretest and Mean Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group for Subsample Boys.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td></td>
<td>179.47</td>
<td>142.33</td>
<td>5.05**</td>
</tr>
</tbody>
</table>

** = P<0.01

Table 34 provides the comparison of mean scores of Academic Stress between the mean pretest and posttest scores of Progressive Muscle Relaxation Group for subsample boys. The mean pretest scores (M=179.47, SD=32.33) is significantly greater than the mean posttest scores (M=142.33, SD=34.41); t (14) = 5.05, P<0.01. Hence it is clear that there is significant difference between mean pretest and mean posttest scores of Academic Stress of students in Progressive Muscle Relaxation Group for subsample boys. The mean posttest score is significantly lower than the mean pretest score. This clearly proves that Progressive Muscle Relaxation exercise is effective in reducing the Academic Stress for subsample boys. The results are represented graphically in Figure 33.
The result is presented graphically in Figure 33.

![Graph showing pretest and posttest scores](image)

**Figure 33.** Comparison of mean pretest and mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group for Subsample Boys

The graphical representation of mean pretest and mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group for Subsample Boys shows that the performance of students in the two tests are dissimilar. Posttest mean score is lower than pretest mean score of Progressive Muscle Relaxation Group for Academic Stress. The graphical observation confirms the result of mean difference analysis.

Comparison of mean pretest and posttest scores of Academic Stress of Progressive Muscle Relaxation Group for subsample girls.

The effectiveness of Progressive Muscle Relaxation in reducing the Academic Stress of students in the Progressive Muscle Relaxation Group was found out by computing the ‘t’ value using paired ‘t’ test. It was then tested for significance.
The consolidated results of the test of significance of difference between mean pretest and mean posttest scores of Academic Stress of the subsample Girls in the Progressive Muscle Relaxation Group is given in Table 35.

Table 35

*Test of Significance of Difference between Mean Pretest and Mean Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group for Subsample Girls.*

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th></th>
<th>Posttest</th>
<th></th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>SD₁</td>
<td>M₂</td>
<td>SD₂</td>
<td></td>
</tr>
<tr>
<td>Progressive Muscle Relaxation</td>
<td>15</td>
<td>161.40</td>
<td>42.97</td>
<td>103.93</td>
<td>15.27</td>
<td>5.39**</td>
</tr>
</tbody>
</table>

** = P<0.01

Table 35 provides the comparison of mean scores of Academic Stress between the pretest and posttest scores of Progressive Muscle Relaxation Group for subsample Girls. The mean pretest score (M=161.40, SD=42.97) is significantly greater than the mean posttest score (M=103.93, SD=15.27); t (14) = 5.39, P<0.01. Hence it is clear that there is significant difference between mean pretest and mean posttest scores of Academic Stress of students in Progressive Muscle Relaxation Group for subsample Girls. The mean posttest score is significantly lower than the pretest mean score. This clearly proves that Progressive Muscle Relaxation Exercise is effective in reducing the Academic Stress for subsample Girls.

The result is presented graphically in Figure 34.
The graphical representation of mean pretest and mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group for subsample Girls shows that the performance of students in the two tests are dissimilar. Posttest mean score is lower than pretest mean score of Bibliotherapy Group for Academic Stress. The Graphical Observation confirms the mean difference analysis.

**Discussion**

Result of test of significance of difference between mean pretest and posttest scores of Progressive Muscle Relaxation for total sample and subsample showed that there exist significant difference in the mean pretest and posttest scores. The mean posttest scores were significantly lower than the mean pretest scores of Academic Stress of experimental group given
Progressive Muscle Relaxation for total sample and subsample. This reveals that Progressive Muscle Relaxation is effective in reducing the Academic Stress of students.

Comparison of mean pretest and mean posttest scores of Academic Stress of secondary school students in the Control Group for total sample and subsamples.

The mean pretest and mean posttest scores of Academic Stress of secondary school students in the Control Group was found out by computing the ‘t’ value using paired ‘t’ test. It was then tested for significance.

The consolidated results of the test of significance of difference between mean pretest and mean posttest scores of Academic Stress of the Control Group for Total sample and Subsample Boys and Girls are given in Table 36.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Total sample</td>
<td>30</td>
<td>170.70</td>
<td>38.70</td>
</tr>
<tr>
<td>Subsample Boys</td>
<td>15</td>
<td>180.73</td>
<td>34.10</td>
</tr>
<tr>
<td>Subsample Girls</td>
<td>15</td>
<td>160.67</td>
<td>41.51</td>
</tr>
</tbody>
</table>

Table 36 provides the comparison of mean scores of Academic Stress between the pretest and posttest scores of the Control Group for total sample
and subsamples Boys and Girls. The mean pretest scores (M= 170.70, SD=38.70) and mean posttest scores (M=169.80, SD = 39.56) for the total sample; t(29) = 1.12, P<0.05 shows that there is no significant difference in the mean pretest and posttest scores of control group for Total sample. Similarly for subsample boys mean pretest score (M=180.73, SD=34.10) and mean posttest score (M=180.27, SD = 35.27); t(14)=0.40, P>0.05 shows that there is no significant difference in the mean pretest and posttest scores of control group for subsample boys. For subsample girls, the mean pretest scores (M=160.67, SD=41.51) and mean posttest scores (M=159.33, SD=41.99); t(14) = 1.17, P>0.05 shows that there is no significant difference in the mean pretest and post scores of control group for subsample girls.

The results are presented graphically in Figures 35 to 37.
The graphical representation of mean pretest and mean posttest scores of Academic Stress of Control Group for Total sample shows that the performance of students in the two tests are almost similar. Posttest mean score is almost similar to pretest mean score of Control Group for Academic Stress. The graphical observation confirms the result of Mean Difference Analysis.

![Figure 36. Comparison of mean pretest and mean posttest scores of Academic Stress of Control Group for subsample boys](image)

The graphical representation of mean pretest and mean posttest scores of Academic Stress of Control Group for subsample Boys shows that the performance of students are almost similar. Posttest mean score is almost similar to pretest mean score of Control Group for Academic Stress. The graphical observation confirms the result of mean difference analysis.
Figure 37. Comparison of mean pretest and mean posttest scores of Academic Stress of Control Group for subsample girls.

The graphical representation of mean pretest and mean posttest scores of Academic Stress of Control Group for subsample girls shows that the performance of students in the two tests are almost similar. Posttest mean score is almost similar to pretest mean score of Control Group for Academic Stress. The graphical observation confirms the result of mean difference analysis.

**Discussion.**

Result of the test of significance of difference between mean pretest and posttest scores of control group showed that there is no significant difference in the mean pretest and posttest scores of Academic Stress for total sample and subsamples. This reveals that there is no significant difference in the mean pretest and post scores of Academic Stress of control group.
Comparison of the effectiveness of Bibliotherapy and Progressive Muscle Relaxation.

This part of the analysis was done to compare the effectiveness of these two methods in reducing the Academic Stress.

Comparison of means of posttest scores of Academic Stress between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for total sample and subsample Boys and Girls was done.

The mean posttest scores of Academic Stress for the Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for total sample and subsample Boys and Girls were found out and compared for significance of the mean difference using test of significance of difference between means of independent samples. The details of analysis are given in the following sections.

Comparison of mean posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group for Academic stress for total sample.

The means and standard deviations of the posttest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Total sample were subjected to mean difference analysis. It was than tested for significance.

The consolidated results of the test of significance of difference in mean posttest scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group are given in Table 37.
Table 37

Test of Significance of Difference between Mean Posttest Scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Total Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>30</td>
<td>96.40</td>
<td>33.15</td>
</tr>
</tbody>
</table>

** *=P<0.01

Table 37 shows the result of t-test conducted to compare the Academic Stress mean scores between experimental groups and control group after the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for total sample. There was significant difference in the mean posttest scores of Academic Stress of Bibliotherapy Group (M = 96.40, SD = 33.15) and Progressive Muscle Relaxation Group (M=123.13, SD= 35.41); t (58) = 3.74, P<0.01. These results suggested that the Bibliotherapy Group and Progressive Muscle Relaxation Group were significantly different in their Academic Stress after giving the intervention.

The result is presented graphically in Figure 38.
The graphical representation of Mean Posttest Scores of Academic Stress for Total sample of Bibliotherapy Group and Progressive Muscle Relaxation Group shows that the performance of students in two groups is dissimilar. Performance of Bibliotherapy Group is better than that of Progressive Muscle Relaxation Group. The graphical observation confirms the results of mean difference analysis.

**Comparison of posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group of Academic Stress for subsample boys**

The Means and Standard Deviations of the posttest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample Boys were subjected to mean difference analysis. It was then tested for significance.
The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Bibliotherapy Group and Progressive Muscle Relaxation Group are given in Table 38.

Table 38

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N_1</td>
<td>M_1</td>
<td>SD_1</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>103.67</td>
<td>25.80</td>
</tr>
</tbody>
</table>

**= P<0.01

Table 38 shows the results of t-test conducted to compare the Academic Stress mean scores between Experimental groups after the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for subsample Boys. There was significant difference in the mean posttest scores of Academic Stress of Bibliotherapy Group (M= 103.67, SD = 25.80) and Progressive Muscle Relaxation Group (M=142.33, SD = 35.41); t (28) = 3.42, P<0.01. These results suggested that the Bibliotherapy Group and Progressive Muscle Relaxation Group were significantly different in their Academic Stress after giving the intervention.

The result is presented graphically in Figure 39.
The graphical representation of Mean Posttest scores of Academic Stress for subsample Boys of Bibliotherapy Group and Progressive Muscle Relaxation Group shows that the performance of students in two groups is dissimilar. Performance of Bibliotherapy Group is better than that of Progressive Muscle Relaxation Group. The graphical observation confirms the results of mean difference analysis.

Comparison of posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group of Academic Stress for subsample girls.

The means and standard deviation of the posttest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample girls were subjected to mean difference analysis. It was then tested for significance.
The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group are given in Table 39.

Table 39

*Test of Significance of Difference between Mean Posttest Scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Subsample Girls*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>89.13</td>
<td>10.98</td>
</tr>
</tbody>
</table>

**= P<0.01

Table 39 shows the result of t-test conducted to compare the Academic Stress mean scores between experimental groups after the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for subsample Girls. There was significant difference in the mean posttest scores of Academic Stress of Bibliotherapy Group (M= 89.13, SD = 10.98) and Progressive Muscle Relaxation Group (M=103.93, SD = 15.27); t (28) = 3.05, P<0.01. These results suggested that the Bibliotherapy Group and Progressive Muscle Relaxation Group were significantly different in their Academic Stress after giving the intervention.

The result is presented graphically in Figure 40.
Figure 40. Posttest mean scores of academic stress of Bibliotherapy Group and Progressive Muscle Relaxation (PMR) Group for subsample girls

The graphical representation of mean posttest scores of Academic Stress for subsample Girls of Bibliotherapy Group and Progressive Muscle Relaxation Group shows that the performance of students in two groups is dissimilar. Performance of Bibliotherapy Group is better than that of Progressive Muscle Relaxation Group. The graphical observation confirms the results of Mean Difference Analysis.

Discussion.

Results of significance of mean posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample and subsamples showed that there exists significant difference in the mean posttest scores of Academic Stress. The mean posttest scores of Experimental Group given Bibliotherapy is more effective than Progressive Muscle Relaxation in reducing the Academic Stress of the given total sample and subsamples.
Comparison of posttest scores of Bibliotherapy Group and Control Group of Academic Stress for total sample.

The means and standard deviations of the posttest scores of Academic Stress of Bibliotherapy Group and Control Group for Total sample were subjected to mean difference analysis. It was then tested for significance.

The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Bibliotherapy Group and Control Group are given in Table 40.

Table 40

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Control Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>30</td>
<td>96.40</td>
<td>20.83</td>
</tr>
</tbody>
</table>

**=P<0.01

Table 40 shows the result of t-test conducted to compare the Academic Stress mean scores between Experimental Group and Control group after the administration of Bibliotherapy for total sample. There was significant difference in the mean posttest scores of Academic Stress of Bibliotherapy Group (M= 96.40, SD = 20.83) and Control Group (M=169.80, SD = 39.56); t (58) = 8.99, P<0.01. These results suggested that the Bibliotherapy Group and Control Group were significantly different in their Academic Stress after giving the intervention.
The result is presented graphically in Figure 41.

![Bar Chart](image)

*Figure 41. Posttest mean scores of Academic Stress of Bibliotherapy Group and Control Group for Total sample.*

The graphical representation of Mean posttest scores of Academic Stress for Bibliotherapy Group and Control Group shows that the performance of students in two groups is dissimilar. Performance of Bibliotherapy Group is better than that of Control Group. The graphical observation confirms the results of mean difference analysis.

*Comparison of posttest scores of Bibliotherapy Group and Control Group of Academic Stress for subsample boys.*

The means and standard deviations of the posttest scores of Academic Stress of Bibliotherapy Group and Control Group for subsample Boys were subjected to mean difference analysis. It was then tested for significance. The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Bibliotherapy Group and Control Group are given in Table 41.
Table 41

Test of Significance of Difference between Mean Posttest Scores of Academic Stress of Experimental Group and Control Group for Subsample Boys

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Control Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>103.67</td>
<td>25.80</td>
</tr>
</tbody>
</table>

**=P<0.01

Table 41 shows the result of t-test conducted to compare the Academic Stress mean scores between Experimental Group and Control group after the administration of Bibliotherapy for Subsample Boys. There was significant difference in the mean posttest scores of Academic Stress of Bibliotherapy Group (M=103.67, SD=25.80) and Control Group (M=180.27, SD=35.27); t (28) = 6.79, P<0.01. These results suggested that the Bibliotherapy Group and Control Group were significantly different in their Academic Stress after giving the intervention.

The result is presented graphically in Figure 42.
The graphical representation of mean posttest scores of Academic Stress for subsample Boys of Bibliotherapy Group and Control Group shows that the performance of students in two groups is dissimilar. Performance of Bibliotherapy Group is better than that of Control Group. The graphical observation confirms the results of mean difference analysis.

**Comparison of posttest scores of Bibliotherapy Group and Control Group on Academic Stress for subsample girls.**

The means and standard deviations of the posttest scores of Academic Stress of Bibliotherapy Group and Control Group for subsample Girls were subjected to mean difference analysis. It was then tested for significance.

The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Bibliotherapy Group and Control Groups are given in Table 42.

Table 42

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Control Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N&lt;sub&gt;1&lt;/sub&gt;</td>
<td>M&lt;sub&gt;1&lt;/sub&gt;</td>
<td>SD&lt;sub&gt;1&lt;/sub&gt;</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>89.13</td>
<td>10.98</td>
</tr>
</tbody>
</table>

**=P<0.01

Table 42 shows the result t-test conducted to compare the Academic Stress mean scores between Experimental Group and Control group after the administration of Bibliotherapy for Subsample Girls. There was significant
difference in the mean posttest scores of Academic Stress of Bibliotherapy Group (M= 89.13, SD = 10.98) and Control Group (M=159.33, SD = 41.99); t (28) = 6.26, P<0.01. These results suggested that the Bibliotherapy Group and Control Group were significantly different in their Academic Stress after giving the intervention.

The result is presented graphically in Figure 43.

![Figure 43](image)

*Figure 43.* Posttest scores of Academic Stress of Bibliotherapy Group and Control Group for subsample Girls.

The graphical representation of mean posttest scores of Academic Stress for subsample Girls of Bibliotherapy Group and Control Group shows that the performance of students in two groups is dissimilar. Performance of students in two groups is dissimilar. Performance of Bibliotherapy Group is better than that of Control Group. The graphical observation confirms the results of mean difference analysis.
Discussion

Results of significance of mean posttest scores of Academic Stress of Bibliotherapy Group and Control group (given no intervention) for total sample and subsamples shows significant difference. The mean posttest scores of Experimental Group given Bibliotherapy was significantly lower than that of Control Group. This reveals that Bibliotherapy is highly effective in reducing Academic Stress of given total sample and subsamples.

Comparison of mean posttest scores of Progressive Muscle Relaxation Group and Control Group on Academic Stress for total sample.

The means and Standard Deviations of the posttest scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for Total sample were subjected to mean difference analysis. It was then tested for significance.

The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Progressive Muscle Relaxation Group and Control Group are given in Table 43.

Table 43

Test of Significance of Difference between Mean Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for Total Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>30</td>
<td>123.13</td>
<td>33.15</td>
</tr>
</tbody>
</table>

**P<0.01**
Table 43 shows the results of t-test conducted to compare the Academic Stress mean scores between Progressive Muscle Relaxation Group and Control Group after the administration of Progressive Muscle Relaxation Exercise for total sample. There was significant difference in the mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group (M=123.13, SD=33.15) and Control Group (M=169.80, SD=39.58); t (58) = 4.95, P<0.01. These results suggested that the Progressive Muscle Relaxation Group and Control Group were significantly different in their Academic Stress after giving the intervention.

The results are presented graphically in Figure 44.

![Posttest mean scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for Total sample.](image)

*Figure 44. Posttest mean scores of Academic Stress of Progressive Muscle Relaxation (PMR) Group and Control Group for Total sample.*

The graphical representation of mean posttest score on Academic Stress for Total sample of Progressive Muscle Relaxation Group and Control Group shows that the performance of students in two groups is dissimilar. Performance of Progressive Muscle Relaxation Group is better than that of
Control Group. The graphical observation confirm the results of mean difference analysis.

*Comparison of mean posttest scores of Progressive Muscle Relaxation Group and Control Group on Academic Stress for subsample boys.*

The means and standard deviations of the posttest score of Academic Stress of Progressive Muscle Relaxation Group and Control Group for subsample Boys were subjected to mean difference analysis. It was then tested for significance.

The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Progressive Muscle Relaxation Group and Control Group are given in Table 44.

Table 44

*Test of Significance of Difference between Mean Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for Subsample Boys*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>142.33</td>
<td>35.41</td>
</tr>
</tbody>
</table>

**=P<0.01

Table 44 shows the results of t-test conducted to compare the Academic Stress mean scores between Experimental Group and Control group after the administration of Progressive Muscle Relaxation for Subsample Boys. There
was significant difference in the mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group (M=142.33, SD = 35.41) and Control Group (M=180.27, SD = 35.67); t (28) = 2.94, P<0.01. These results suggested that the Progressive Muscle Relaxation Group and Control Group were significantly different in their Academic Stress after giving the intervention.

The result are presented graphically in Figure 45.

![Graph]

*Figure 45. Posttest mean scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for subsample Boys.*

The graphical representation of mean posttest scores of Academic Stress for subsample Boys of Progressive Muscle Relaxation Group and Control Group shows that the performance of students in two groups is dissimilar. Performance of Progressive Muscle Relaxation Group is better than that of Control Group. The graphical observation confirms the results of mean difference analysis.
Comparison of mean posttest scores of Progressive Muscle Relaxation Group and Control Group on Academic Stress for subsample girls.

The means and standard deviations of Posttest scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for subsample Girls were subjected to mean difference analysis. It was then tested for significance.

The consolidated results of the test of significance of difference between mean posttest scores of Academic Stress of the Progressive Muscle Relaxation Group and Control Group are given in Table 45.

Table 45
Test of Significance of Difference between Mean Posttest Scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for Subsample Girls

<table>
<thead>
<tr>
<th>Variable</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁ M₁ SD₁</td>
<td>N₂ M₂ SD₂</td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15 103.93 15.27</td>
<td>15 159.33 41.99</td>
<td>4.80**</td>
</tr>
</tbody>
</table>

**=P<0.01

Table 45 shows the result of t-test conducted to compare the Academic Stress mean scores between Experimental Group and Control group after the administration of Progressive Muscle Relaxation for Subsample Girls. There was significant difference in the mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group (M=103.93, SD=15.27) and Control Group (M=159.33, SD= 41.99); t (28) = 4.80, P<0.01. These results suggested
that the Progressive Muscle Relaxation Group and Control Group were significantly different in their Academic Stress after giving the intervention.

The result are presented graphically in Figure 46.

![Posttest mean scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for Subsample Girls.](image)

**Figure 46.** Posttest mean scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for Subsample Girls.

The graphical representation of mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for subsample Girls shows that there two groups are dissimilar. Performance of Progressive Muscle Relaxation Group is better than that of Control Group. The graphical observation confirms the results of mean difference Analysis.

**Discussion.**

Result of tests of significance of mean posttest scores of Academic Stress of Experimental Group (given Progressive Muscle Relaxation) and Control Group (given no intervention) for total sample and subsamples shows significant difference. The mean posttest scores of Experimental Group given
Progressive Muscle Relaxation is significantly lower than that of Control group. This reveals that Progressive Muscle Relaxation is effective in reducing Academic Stress of given total sample and subsamples.

**Comparison of gain scores of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group.**

The mean gain scores of Academic Stress of secondary school students of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for Total sample and Subsample Boys and Girls were found out and compared for significance of mean difference using the test of significance of difference between means of independent samples. The magnitude of effect of Bibliotherapy and Progressive Muscle Relaxation was also found using effect size measure for two independent groups. The details of analysis are given in the following sections.

**Comparison of mean gain scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample.**

The means and standard deviations of the gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample was subjected to mean difference analysis. It was then tested for significance. Effect size of Bibliotherapy was also found out.

The consolidated results of the test of significance of difference between gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group are given in Table 46.
Table 46

Test of Significance of Difference between Mean Gain Scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Total Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁, M₁, SD₁</td>
<td>N₂, M₂, SD₂</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>30, 73.07, 26.64</td>
<td>30, 47.30, 36.37</td>
<td>3.00**</td>
<td>0.81</td>
</tr>
</tbody>
</table>

***=P<0.01

Table 46 shows the result of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Groups after the administration of Bibliotherapy and Progressive Muscle Relaxation Exercise for total sample. There was significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group (M=73.07, SD=26.64) and Progressive Muscle Relaxation Group (M=47.30, SD=36.37); t (58) = 3, P<0.01. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group. The mean gain scores of Bibliotherapy Group is significantly greater than Progressive Muscle Relaxation Group for Academic Stress. This clearly shows that Bibliotherapy is more effective for Total sample. This is also evident from Cohen’s $d = 0.81$ implying large effect size.

The result is presented graphically in Figure 47.
Figure 47. Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample

The graphical representation of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample shows that the performance of students in the two groups is dissimilar. Mean gain scores of Bibliotherapy Group is greater than mean gain scores of Progressive Muscle Relaxation Group. The graphical observation confirms the result of mean difference analysis.

Comparison of mean gain scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample boys.

The means and standard deviation of the gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample boys were subjected to mean difference analysis. It was then tested for significance. Effect size of Bibliotherapy was also found out.
The consolidated results of the test of significance of difference between mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group are given in Table 47.

Table 47

Test of Significance of Difference between Mean Gain Scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Subsample Boys

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁ M₁ SD₁</td>
<td>N₂ M₂ SD₂</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15 76.87 24.18</td>
<td>15 37.13 28.48</td>
<td>4.12**</td>
<td>1.51</td>
</tr>
</tbody>
</table>

**P<0.01

Table 47 shows the results of t-test conducted to compare the mean gain scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group after the administration of Bibliotherapy and Progressive Muscle Relaxation for Subsample Boys. There was significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group (M=76.87, SD=24.18) and Progressive Muscle Relaxation Group (M=37.13, SD=28.48); t (28) = 4.12, P<0.01. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group. The mean gain scores of Bibliotherapy Group is significantly greater than that of Progressive Muscle Relaxation Group for Academic Stress. This clearly shows that Bibliotherapy is more effective for Subsample Boys. This is also evident from Cohen’s d = 1.51 implying large effect size.
The results are presented graphically in Figure 48.

![Figure 48](image.png)

*Figure 48. Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample Boys.*

The graphical representation of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample (Boys) shows that the performance of students in two groups is dissimilar. Mean gain scores of Bibliotherapy Group is greater than mean gain scores of Progressive Muscle Relaxation Group. The graphical observation confirms the results of Mean Difference Analysis.

*Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample girls.*

The means and standard deviations of the mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample Girls were subjected to mean difference analysis. It was then tested for significance. Effect size was also found out.
The consolidated results of the test of significance of difference between mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group are given in Table 48.

Table 48

*Test of Significance of Difference between Mean Gain Scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Subsample Girls*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁  M₁  SD₁</td>
<td>N₂  M₂  SD₂</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15  69.27  34.71</td>
<td>15  57.47  41.33</td>
<td>8.47**</td>
<td>0.31</td>
</tr>
</tbody>
</table>

** = P < 0.01

From the Table 48 shows the result of t-test conducted to compare the mean gain scores of Academic Stress between experimental groups after the administration of Bibliotherapy and Progressive Muscle Relaxation for Subsample Girls. There was significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group (M=69.27, SD=34.71) and Progressive Muscle Relaxation Group (M=57.47, SD=41.33); t (28) = 8.47, P < 0.01. Hence it is clear that there is significant difference between mean gain on Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group. The mean gain scores of Bibliotherapy Group is significantly greater than Progressive Muscle Relaxation Group for Academic Stress. This clearly shows that Bibliotherapy is more effective for subsample Girls. This is also evident from Cohen’s $d = 0.31$ implying small effect size.
The results are presented graphically in Figure 49.

Figure 49. Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for Subsample Girls.

The graphical representation of mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group for subsample Girls shows that the performance of students in two groups is dissimilar. Mean gain scores of Bibliotherapy Group is greater than the mean gain score of Progressive Muscle Relaxation Group. The graphical observation confirms the results of mean difference analysis.

**Discussion**

Results of test of significance of difference between mean gain scores of Bibliotherapy Group given Bibliotherapy and Progressive Muscle Relaxation Group given Progressive Muscle Relaxation showed that there exists significant difference between the groups. The mean gain scores of Bibliotherapy Group is greater than the mean gain scores of Progressive...
Muscle Relaxation group. This reveals that Bibliotherapy is more effective than Progressive Muscle Relaxation in reducing the Academic Stress for given total sample and subsamples.

Comparison of mean gain scores of Academic Stress between Bibliotherapy Group and Control Group for total sample.

The means and standard deviations of gain scores of Academic Stress of Bibliotherapy Group and Control group for Total sample were subjected to mean difference analysis. It was then tested for significance. Effect size was also found out.

The consolidated results of the test of significance of difference between mean gain scores of Academic Stress between Bibliotherapy Group and Control group for Total sample are given in Table 49.

Table 49
Test of Significance of Difference between Mean Gain Scores of Academic Stress of Bibliotherapy Group and Control Group for Total Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Control Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N1</td>
<td>M1</td>
<td>SD1</td>
<td>N2</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>30</td>
<td>73.07</td>
<td>26.64</td>
<td>30</td>
</tr>
</tbody>
</table>

** = P<0.01

Table 49 shows the results of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Group and Control Group after the administration of Bibliotherapy for Total sample. There was significant difference in the mean gain scores of Academic Stress of
Bibliotherapy Group (M=73.07, SD=26.64) and Control Group (M=0.90, SD=4.42); t (58) = 13.19, P<0.01. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Bibliotherapy Group and Control Group. The mean gain scores of Bibliotherapy Group is significantly greater than that of Control Group for Academic Stress. This clearly shows that Bibliotherapy is highly effective for Total sample. This is also evident from Cohen’s $d = 3.78$ implying large effect size.

The result are represented graphically in Figure 50

![Graph showing comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Control group for Total sample.](image)

Figure 50. Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Control group for Total sample

The graphical representation of mean gain score of Academic Stress of Bibliotherapy Group and Control group for total sample shows that the performance of students in two groups is dissimilar. Mean gain scores of Bibliotherapy Group is greater than mean gain scores of Control group for Academic Stress. The graphical observation confirms the results of mean difference analysis.
Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Control Group for subsample boys.

The means and standard deviations of gain scores of Academic Stress of Bibliotherapy Group and Control group for subsample Boys were subjected to mean difference analysis. It was then tested for significance and effect size was also found out.

The consolidated results of test of significance of difference between mean gain scores of Academic Stress of Bibliotherapy Group and Control group for subsample Boys are given in Table 50.

Table 50

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Control Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁ M₁ SD₁</td>
<td>N₂ M₂ SD₂</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15 76.87 24.18</td>
<td>15 0.47 4.55</td>
<td>12.18</td>
<td>4.39</td>
</tr>
</tbody>
</table>

Table 50 shows the results of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Group and Control Group after the administration of Bibliotherapy for Subsample Boys. There was significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group (M=76.87, SD=24.18) and Control Group (M=0.47, SD=4.55); t (28) = 12.18, P<0.01. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Bibliotherapy Group and Control Group. The mean gain scores of Bibliotherapy Group is significantly greater than Control Group for Academic Stress. This clearly
shows that Bibliotherapy is highly effective for Subsample Boys. This is also evident from Cohen’s $d = 4.39$ implying large effect size.

The results are represented graphically in Figure 51.

*Figure 51. Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Control group for subsample Boys.*

The graphical representation of mean gain scores of Academic stress of Bibliotherapy group and Control group for subsample Boys shows that the performance of students in two groups is dissimilar. Mean gain scores of Bibliotherapy Group is greater than mean gain scores of Control group. The graphical observation confirms the result of mean difference analysis.

**Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Control group for subsample girls.**

The consolidated results of test of significance of difference between mean gain scores of Academic Stress of Bibliotherapy Group and Control group for subsample Girls are given in Table 51.
Table 51

*Test of Significance of Difference between Mean Gain Scores of Academic Stress Bibliotherapy Group and Control Group for Subsample Girls*

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bibliotherapy Group</th>
<th>Control Group</th>
<th>t</th>
<th>Cohen’s $d$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$N_1$</td>
<td>$M_1$</td>
<td>$SD_1$</td>
<td>$N_2$</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>69.27</td>
<td>34.71</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 51 shows the results of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Group and Control Group after the administration of Bibliotherapy for Subsample Girls. There was significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group ($M=69.27$, $SD=34.71$) and Control Group ($M=1.33$, $SD=4.40$); $t(28) = 7.52$, $P<0.01$. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Bibliotherapy Group and Control Group. The mean gain scores of Bibliotherapy Group is significantly greater than Control Group for Academic Stress. This clearly shows that Bibliotherapy is highly effective for Subsample Girls. This is also evident from Cohen’s $d = 2.75$ implying large effect size.

The results are presented graphically in Figure 52.
Figure 52. Comparison of mean gain scores of Academic Stress of Bibliotherapy Group and Control group for Subsample Girls.

The graphical representation of mean gain scores of Academic Stress of Bibliotherapy Group and Control Group for subsample girls shows that the performance of students in two groups is dissimilar. Mean gain scores of Bibliotherapy Group is greater than mean gain scores of Control group. The graphical observation confirms the results of mean difference analysis.

**Discussion.**

Results of test of significance of difference between mean gain scores of Bibliotherapy Group given Bibliotherapy and Control Group showed that there exists significant difference between the groups. The mean gain scores of Bibliotherapy Group is greater than the Mean Gain Scores of Control group. This reveals that Bibliotherapy is highly effective in reducing the Academic Stress for given total sample and subsample.
Comparison of mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control Group for total sample.

The means and standard deviations of the gain scores on Academic Stress of Progressive Muscle Relaxation Group and Control group for total sample were subjected to mean difference analysis. It was then tested for significance and effect size was also found out.

The consolidated results of the test of significance of difference between main gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for Total sample are given in Table 52.

Table 52

<table>
<thead>
<tr>
<th>Variable</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁ M₁ SD₁</td>
<td>N₂ M₂ SD₂</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>30 47.30 36.37</td>
<td>30 .90 4.42</td>
<td>6.94**</td>
<td>1.79</td>
</tr>
</tbody>
</table>

**= P<0.01

Table 52 shows that shows the results of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Group and Control Group after the administration of Progressive Muscle Relaxation for Total sample. There was significant difference in the mean gain scores of Academic Stress of Progressive Muscle Relaxation Group (M=47.30, SD=36.37) and Control Group (M=0.90, SD=4.42); t (58) = 6.94, P<0.01.
Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group. The mean gain scores of Progressive Muscle Relaxation Group is significantly greater than Control Group for Academic Stress. This clearly shows that Progressive Muscle Relaxation is highly effective for Total sample. This is also evident from Cohen’s $d = 1.79$ implying large effect size.

The results are presented graphically in Figure 53.

*Figure 53.* Comparison of mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control Group for Total sample.

The graphical representation of mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for total sample shows that the performance of students in the two groups is dissimilar. Mean gain scores of Progressive Muscle Relaxation Group is greater than the gain scores of Control group for Academic Stress. The graphical observation confirms the results of mean difference analysis.
Comparison of mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control group for subsample boys.

The means and standard deviations of the gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for subsample Boys were subjected to mean difference analysis. It was then tested for significance. Effect size was also found out.

The consolidated results of the test of significance of difference between mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for subsample Boys are given in Table 53.

Table 53

Test of Significance of Difference between Mean Gain Scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for subsample Boys

<table>
<thead>
<tr>
<th>Variable</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N₁</td>
<td>M₁</td>
<td>SD₁</td>
<td>N₂</td>
</tr>
<tr>
<td>Academic Stress</td>
<td>15</td>
<td>37.13</td>
<td>28.48</td>
<td>15</td>
</tr>
</tbody>
</table>

**P<0.01

Table 53 shows that shows the results of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Group and Control Group after the administration of Progressive Muscle Relaxation for Subsample Boys. There was significant difference in the mean gain scores of
Academic Stress of Progressive Muscle Relaxation Group (M=37.13, SD=28.48) and Control Group (M=0.47, SD=4.55); t (28) =5.05, P<0.01. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group. The mean gain scores of Progressive Muscle Relaxation Group is significantly greater than Control Group for Academic Stress. This clearly shows that Progressive Muscle Relaxation is highly effective for Subsample Boys. This is also evident from Cohen’s $d = 1.80$ implying large effect size.

The results are presented graphically in Figure 54.

![Figure 54. Comparison of mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control group for subsample Boys.](image)

The graphical representation of mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for subsample Boys shows that the performance of students in the two groups is dissimilar. Mean gain scores of Progressive Muscle Relaxation Group is greater than the
mean gain scores of Progressive Muscle Relaxation Group is greater than the mean gain scores of control group for Academic Stress. The graphical observation confirms the results of mean difference analysis.

**Comparison of mean gain scores of Academic Stress between Progressive Muscle Relaxation and Control group for subsample girls.**

The means and standard deviations of the gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for subsample Girls was subjected to mean difference analysis. It was then tested for significance and effect size was also found out.

The consolidated results of the test of significance of difference between mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group for subsample Girls are given in Table 54.

Table 54

<table>
<thead>
<tr>
<th>Variable</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
<th>t</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>15  57.47  41.33</td>
<td>15  1.33</td>
<td>4.40</td>
<td>5.23**</td>
</tr>
</tbody>
</table>

**=P<0.01

Table 54 shows that the results of t-test conducted to compare the mean gain scores of Academic Stress between Experimental Group and Control Group after the administration of Progressive Muscle Relaxation for Subsample
Girls. There was significant difference in the mean gain scores of Academic Stress of Progressive Muscle Relaxation Group (M=57.47, SD=41.33) and Control Group (M=1.33, SD=4.40); t (28) = 5.23, P<0.01. Hence it is clear that there is significant difference between mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control Group. The mean gain scores of Progressive Muscle Relaxation Group is significantly greater than Control Group for Academic Stress. This clearly shows that Progressive Muscle Relaxation is highly effective for Subsample Girls. This is also evident from Cohen’s $d = 1.96$ implying large effect size.

The result are presented graphically in Figure 55.

![Figure 55. Comparison of mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and Control group for subsample Girls](image)

Graphical representation of mean gain scores of Academic Stress of Progressive Muscle Relaxation Group, and Control group shows that the performance of students in two groups is dissimilar. Mean gain scores of Progressive Muscle Relaxation Group is greater than mean gain scores of
Control Group for Academic Stress. The graphical observation confirms the results of mean difference analysis.

**Discussion.**

Results of test of significance of difference between mean gain scores of Experimental Group given Progressive Muscle Relaxation and Control group showed that there exists significant difference between the groups. The mean gain scores of Progressive Muscle Relaxation Group is greater than the Mean Gain Scores of Control group. This reveals that Progressive Muscle Relaxation is effective in reducing the Academic Stress for given total sample and subsample.

**Discussion on the genuineness of the difference between Experimental Groups and Control Groups.**

*Genuineness of the difference in the performance of the groups.*

The analysis of the pretest scores of the experimental groups and control group showed that mean scores of Academic Stress of secondary school students were more or less equitable. After administering the Bibliotherapy and Progressive Muscle Relaxation for Experimental Groups and not administering any of the methods in Control Group, it was found that the Academic Stress of students in Bibliotherapy Group and Progressive Muscle Relaxation Group are lower compared to Control Group. And it was also found that the Academic Stress of student in Bibliotherapy Group was lower than that of Progressive Muscle Relaxation Group. Hence it can be tentatively concluded that Bibliotherapy and Progressive Muscle Relaxation
can reduce the Academic Stress of secondary school students and Bibliotherapy is superior in reducing Academic Stress than Progressive Muscle Relaxation. But it cannot be conclusively stated that the groups differ significantly by just analyzing pretest and posttest scores of three groups. So the results were substantiated using the technique of Analysis of Covariance. The analysis done in this regard is given in the subsequent sections.

By employing single factor ANCOVA, the investigator could further study the relative effectiveness of Bibliotherapy and Progressive Muscle Relaxation in reducing Academic Stress after controlling the pretest score as covariate. The analysis was done for Total sample. The basic assumptions of using ANCOVA such as linearity and homogeneity were ensured using statistical package for social sciences. However the examination of the major assumptions revealed that the basic assumptions are met to a satisfactory extent.

*Test for basic assumptions.*

The basic assumptions of the ANCOVA were examined by analyzing the data collected. The results of the analysis are presented as follows.

*Linear relationship between the dependent variable and the covariate.*

The nature of the relationship between the Dependent Variables and the covariate was studied using scatter plots. A visual examination of the scatter plots revealed that the dependent variables and covariates did not depart greatly from linearity.

Scatter plots of the covariate against Dependent Variable (Academic Stress) are present in Figure 56 to 58.
Figure 56. Scatter plot of Academic Stress with the Covariate Pretest Score of Bibliotherapy Group and Progressive Muscle Relaxation Group for Total sample.

Figure 57. Scatter plot of Academic Stress with the covariate pretest of Bibliotherapy Group and Control group for Total sample.
Figure 58. Scatter plot of Academic Stress with the Covariate pretest of Progressive Muscle Relaxation Group and Control group for Total sample.

**Homogeneity of variance.**

Leven’s test was used for testing the homogeneity of graphs. This test is designed to test the equality of group variance. That means testing whether the variance of groups significantly differ or not. The result shows that there is no significant difference for dependent variable of the three groups for total sample and subsamples. The result of homogeneity of variance is given in Table 55.

Table 55

<table>
<thead>
<tr>
<th>Groups</th>
<th>Leven’s Static</th>
<th>df&lt;sub&gt;1&lt;/sub&gt;</th>
<th>df&lt;sub&gt;2&lt;/sub&gt;</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bibliotherapy Group</td>
<td>11.95</td>
<td>1</td>
<td>58</td>
<td>.001</td>
</tr>
<tr>
<td>Progressive Muscle Relaxation Group</td>
<td>4.15</td>
<td>1</td>
<td>58</td>
<td>.046</td>
</tr>
<tr>
<td>Control Group</td>
<td>17.35</td>
<td>1</td>
<td>58</td>
<td>.000</td>
</tr>
</tbody>
</table>
Analysis of Co-variance (ANCOVA) for Academic Stress - Pretest Scores of Bibliotherapy Group and Progressive Muscle Relaxation Group as Covariate.

This part of the analysis was done to examine whether significant changes exists in the mean posttest scores of Academic Stress when pretest scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group were taken as covariate. Summary of the results of ANCOVA is given in Table 56.

Table 56
Summary of Analysis of Covariance (ANCOVA) for Academic Stress- Pretest Scores of Bibliotherapy Group and Progressive Muscle Relaxation Group as Covariate for Total Sample

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>10416.58</td>
<td>1</td>
<td>1041.58</td>
<td>19.37**</td>
</tr>
<tr>
<td>Within</td>
<td>30646.00</td>
<td>57</td>
<td>537.65</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>778106.00</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**= P<0.01

Table 56 shows that F-test supports the effectiveness of intervention on Academic Stress of secondary school students after controlling pretest scores F (1, 57) = 19.37, P<.01. The result therefore suggests that the variation in the posttest scores of Academic Stress cannot be attributed to the influence of pretest scores of Academic Stress. Hence result of the ANCOVA suggests that, when a linear adjustment is made for the effect of variation due to the difference in pretest scores of the subjects on Academic Stress, there exist
statistically significant difference between the Bibliotherapy Group and Progressive Muscle Relaxation Group.

_Bonferroni’s Test of Post-hoc Comparison of Adjusted Means between Bibliotherapy Group and Progressive Muscle Relaxation Group for Total Sample._

To find out, of the two groups which received two different interventions that is Bibliotherapy Group and Progressive Muscle Relaxation Group which one differ in the adjusted mean posttest scores of Academic Stress, test of significance of difference between adjusted means was applied.

The data and results of the post-hoc comparison of the adjusted mean posttest scores of Academic Stress is presented in Table 57.

**Table 57**

_Bonferroni’s Test of Post-hoc Comparison of Adjusted Means between Bibliotherapy Group and Progressive Muscle Relaxation Group for Total Sample_

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Adjusted Mean Bibliotherapy Group</th>
<th>Adjusted Mean Progressive Muscle Relaxation Group</th>
<th>Standard Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>96.59</td>
<td>122.9</td>
<td>4.23</td>
<td>6.22**</td>
</tr>
</tbody>
</table>

** = P<.01

As per table 56 regarding the test of significance of difference between adjusted mean posttest scores of Academic Stress of Bibliotherapy Group (M=96.59) and Progressive Muscle Relaxation Group (M=122.9; t(58)=6.22, p<0.01), it is noted that the low mean score associated with Bibliotherapy Group given Bibliotherapy suggested the advantage of Bibliotherapy over Progressive Muscle Relaxation.
Analysis of Covariance (ANCOVA) for Academic Stress Pretest Scores of Bibliotherapy Group and Control Group as Covariate.

To examine whether significant changes exist in the mean scores of Academic Stress for total sample, the pretest scores of Academic Stress was taken as covariate. Summary of results of ANCOVA is given in Table 58.

Table 58

Summary of Analysis of Covariance (ANCOVA) for Academic Stress- Pretest Scores of Bibliotherapy Group and Control Group as Covariate for Total Sample

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>78965.13</td>
<td>1</td>
<td>78965.13</td>
<td>270.47**</td>
</tr>
<tr>
<td>Within</td>
<td>16641.36</td>
<td>57</td>
<td>291.95</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1201722.00</td>
<td>60</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** = P<0.01

Table 58 shows that F-test supports the effectiveness of intervention on Academic Stress of secondary school students after controlling pretest scores F (1, 57) = 270.47, P<.01. The result therefore suggests that the variation in the posttest scores of Academic Stress cannot be attributed to the influence of pretest scores of Academic Stress. Hence result of the ANCOVA suggests that, when a linear adjustment is made for the effect of variation due to the difference in pretest scores of the subjects on Academic Stress, there exist statistically significant difference between the Bibliotherapy Group and Control Group.
Bonferroni’s Test of Post-hoc Comparison of Adjusted Means between Bibliotherapy Group and Control Group for total sample.

To find out, of the two groups which received two different treatments, that is Experimental Group given Bibliotherapy and Control Group given no intervention, which differs in the adjusted mean posttest scores of Academic Stress, the test of significance of difference between adjusted mean was applied. The data and results of the post hoc comparison of adjusted mean posttest scores of Academic Stress is presented in Table 59.

Table 59

Bonferroni’s Test of Post-hoc Comparison of Adjusted Means between Bibliotherapy Group and Control Group for Total Sample

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Adjusted Mean Bibliotherapy Group</th>
<th>Adjusted Mean Progressive Muscle Relaxation Group</th>
<th>Standard Error</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic Stress</td>
<td>96.82</td>
<td>169.40</td>
<td>3.12</td>
<td>23.26**</td>
</tr>
</tbody>
</table>

**=P<0.01

As per Table 58 regarding the test of significance of difference between adjusted mean posttest scores of Academic Stress of Bibliotherapy Group (M=96.82) and Control Group (M=69.40; t(58)= 23.26, p<.01). It is noted that the low mean score associated with Bibliotherapy Group given Bibliotherapy suggested the advantage of Bibliotherapy.

It is noted that low mean score is associated with Bibliotherapy Group given Bibliotherapy suggesting effectiveness in reducing academic stress.
Analysis of Covariance (ANCOVA) for Academic Stress-Pretest Scores of Progressive Muscle Relaxation Group and Control Group for total Sample.

This part of the analysis was done to examine whether significant changes exist in the mean posttest scores of Academic Stress when pretest scores of Academic Stress was taken as covariate.

Summary of results of ANCOVA is given in Table 60.

Table 60
Summary of Analysis of Co-variance (ANCOVA) for Academic Stress Pretest Scores of Progressive Muscle Relaxation Group and Control Group as Covariate for Total Sample

<table>
<thead>
<tr>
<th>Source of Variance</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
<th>F</th>
<th>Level of significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between</td>
<td>3239.48</td>
<td>1</td>
<td>32397.48</td>
<td>57.32</td>
<td>P&lt;.01</td>
</tr>
<tr>
<td>Within</td>
<td>32218.06</td>
<td>57</td>
<td>565.23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1397076.00</td>
<td>60</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 60 shows that F-test supports the effectiveness of intervention on Academic Stress of secondary school students after controlling pretest scores F (1, 57) = 57.32, P<.01. The result therefore suggests that the variation in the posttest scores of Academic Stress cannot be attributed to the influence of pretest scores of Academic Stress. Hence result of the ANCOVA suggests that, when a linear adjustment is made for the effect of variation due to the difference in pretest scores of the subjects on Academic Stress, there exist statistically significant difference between the Progressive Muscle Relaxation Group and Control Group.
Bonferroni’s Test of Post-hoc Comparison of Adjusted Means between Progressive Muscle Relaxation Group and Control Group for Total Sample.

To find out of the two groups, that is Experimental Group received Progressive Muscle Relaxation and Control group received no intervention, which differs in adjusted mean posttest scores of Academic Stress, test of significance of difference between adjusted means was applied.

The data and results of the post-hoc comparison of the adjusted mean posttest scores of Academic Stress is presented in Table 61.

Table 61

Bonferroni’s Test of Post-hoc Comparison of Adjusted Means between Progressive Muscle Relaxation Group and Control Group for Total Sample

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Adjusted Mean</th>
<th></th>
<th></th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bibliotherapy Group</td>
<td>Control Group</td>
<td>Standard Error</td>
<td></td>
</tr>
<tr>
<td>Academic Stress</td>
<td>123.20</td>
<td>169.70</td>
<td>4.34</td>
<td>10.71**</td>
</tr>
</tbody>
</table>

**= P<0.01

As per Table 61 regarding the test of significance of difference between adjusted mean posttest scores of Academic Stress of Progressive Muscle Relaxation Group (M=123.20) and Control Group (M=169.70; t(58)= 10.71, p<.01).

It is noted that high mean is associated with Experimental Group, that was given Progressive Muscle Relaxation suggesting the effectiveness of Progressive Muscle Relaxation in reducing Academic Stress.
Discussion

The result of Analysis of Covariance for Academic Stress pretest scores of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group and the Post-hoc Comparison of Adjusted mean scores even after removing the effects of pretest scores as covariate showed significant difference in their mean Academic Stress score. This difference is due to lower academic stress associated with the Experimental Groups given Bibliotherapy and Progressive Muscle Relaxation.

Conclusion

From the analysis of data obtained prior to the intervention it can be concluded that experimental and control group students were equal in their Academic Stress. The Academic Stress of students were high and were almost equal. Three intact groups were randomly selected for the study, two experimental groups and one control group. The three groups were then given pretest and were compared based on pretest scores and was found to be equivalent.

After the administration of intervention to two experimental groups and no treatment to control group, posttest were conducted. The comparison of posttest scores showed significant difference between all the three groups. Comparing the mean pretest and posttest scores showed significant difference for the two experimental groups and no significant effectiveness for control groups. Comparing the intervention it was found that Bibliotherapy showed more effect on Academic Stress. Both the intervention made mental difference in the scores of experimental groups from which it can be concluded that the interventions are effective in helping the students to cope with their Academic Stress.
Chapter V

Summary, Findings, & Suggestions

- Restatement of the Problem
- Variables
- Objectives of the Study
- Hypotheses of the Study
- Methodology
- Major Findings
- Tenability of Hypotheses
- Conclusion
- Educational Implications
- Suggestion for Further Research
SUMMARY, FINDINGS AND SUGGESTIONS

This chapter briefly reviews the study, presenting the various aspects of the study such as variables, objectives, hypotheses, methodology, major findings of the study, tenability of hypotheses, educational implications and suggestions for further research.

Restatement of the Problem

The present study is entitled as “EFFECTIVENESS OF BIBLIOTherAPy AND PROGRESSIVE MusCLE RELAXATION ON ACADeMIC STRESS REDUCTION AMONG SECONDARY SCHOOL STUDENTS OF KERALA”

Variables

A preliminary survey among the secondary school teachers and students revealed that though there are physical education training, work experience classes, yoga and other extracurricular activities, there exist no systematic methods to help the children cope with their Academic Stress. So the researcher used Bibliotherapy and Progressive Muscle Relaxation to help the children to cope with their Academic Stress.

Independent Variables

Independent variable is the intervention programme for stress reduction. The two intervention programmes Bibliotherapy and Progressive Muscle Relaxation are considered as the independent variables.
Dependent Variable

Academic Stress is taken as dependent variable of the study.

Objectives of the Study

1. To check the views of teachers and students on giving certain programmes to reduce Academic Stress.

2. To identify the existing level of academic stress of secondary school students for total sample and subsample based on gender.

3. To find out effectiveness of Bibliotherapy and Relaxation Exercise on Academic Stress of secondary school students for total sample and subsample based on gender.

4. To compare the effectiveness of Bibliotherapy and Relaxation Exercise on academic stress of secondary students for total sample and subsample based on gender.

5. To compare the adjusted mean scores of dependent variable between experimental groups and control group by considering pretest scores as covariate.

Hypotheses of the Study

The hypotheses set for the study are:

1. The is no significant difference in the pretest scores of Academic Stress of Secondary school students of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for

   a) Total sample
   b) Subsample boys
   c) Subsample girls
2. There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

3. There is no significant difference in between the mean pretest scores of Academic Stress of Secondary school students of Bibliotherapy Group and Progressive Muscle Relaxation Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

4. There is no significant difference in the mean pretest scores of Academic Stress of Secondary school students of Bibliotherapy Group and Control Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

5. There is no significant difference in the mean pretest scores Academic Stress of Secondary school students of Progressive Muscle Relaxation Group and Control Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls
6. There is significant difference in the mean Pretest and Posttest scores of Academic Stress of Bibliotherapy Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

7. There is significant difference in the mean Pretest and Posttest scores of Academic Stress of Progressive Muscle Relaxation Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

8. There is no significant difference in the mean Pretest and Posttest scores of Academic Stress of Control group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

9. There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

10. There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group and Control Group for
    a) Total sample
    b) Subsample boys
    c) Subsample girls
11. There is significant difference in the mean posttest scores of Academic Stress between Progressive Muscle Relaxation Group and Control Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

12. There is significant difference in the mean gain scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

13. There is significant difference in the mean gain scores of Academic Stress between Bibliotherapy Group and Control group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls

14. There is significant difference in the mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control Group for
   a) Total sample
   b) Subsample boys
   c) Subsample girls
15. There is significant difference in the adjusted mean scores of Academic Stress of Secondary school students between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group by considering pretest scores as co-variate.

**Methodology**

Methodology of the present study is described under the following headings.

**Phase I- Preliminary Survey**

**Design**

A survey was conducted among secondary school teachers and students to understand about the present situations and the need for interventions regarding stress management.

**Sample**

Investigator selected 50 secondary school teachers and 400 secondary school students randomly from different schools of Kozhikode district randomly selected for the study.

**Tools used for the study**

1. Questionnaire on Views of Students on Stress Reduction Programme (Meera & Praseeda, 2011)

2. Questionnaire on Views of Teachers on Stress Reduction Programme (Meera & Praseeda, 2011)
Phase II- Experimental Phase

**Design**

\[
\begin{align*}
G_1 & \quad O_1 \quad X_1 \quad O_4 \\
G_2 & \quad O_2 \quad X_2 \quad O_5 \\
G_3 & \quad O_3 \quad X_6
\end{align*}
\]

Where 
- \(G_1\) – Bibliotherapy Group
- \(G_2\) – Progressive Muscle Relaxation Group
- \(G_3\) – Control Group
- \(O_1\) – Pretest for Bibliotherapy Group
- \(O_2\) – Pretest for Progressive Muscle Relaxation Group
- \(O_3\) – Pretest for Control group
- \(O_4\) – Posttest for Bibliotherapy Group
- \(O_5\) – Posttest for Progressive Muscle Relaxation Group
- \(O_6\) – Posttest for Control Group
- \(X_1\) – Bibliotherapy
- \(X_2\) – Progressive Muscle Relaxation

Pretest posttest non-equivalent group design was employed. Bibliotherapy and Progressive Muscle Relaxation were given to two experimental groups and no such intervention was given to control group.

**Sample**

Secondary school students are the sample for the present study. They were selected from a school randomly selected from the different schools selected for survey. Three classes were selected and randomly assigned
Bibliotherapy Group and Progressive Muscle Relaxation Group and Control group. Each group consisted of 30 students.

*Distribution of the Samples Selected for the Study*

<table>
<thead>
<tr>
<th>Bibliotherapy Group</th>
<th>Progressive Muscle Relaxation Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys</td>
<td>Girls</td>
<td>Total</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>30</td>
</tr>
</tbody>
</table>

**Tools**

Investigator developed and used the following tools.

1. Academic Stress Inventory (Meera & Praseeda, 2012)
2. Bibliotherapy Lesson Frames (Meera & Praseeda, 2012)
4. Progressive Muscle Relaxation Technique (Based on Jacobson’s Progressive Muscle Relaxation Techniques)

**Statistical Techniques Used**

1. Percentage Analysis
2. One-way ANOVA
3. Test of Significance of Difference between Means
4. ANCOVA
Summary

Major Findings

Result of Analysis of Variance of Academic Stress Pretest Scores for Total Sample and Subsample based on Gender

The mean pretest scores of three groups (Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group) were subjected to ANOVA. There was no significant difference in the scores of Academic Stress, $F(2, 87)= 0.01, P>.05$ for total sample and $F (2,42) = .01, P>.05$ for subsample boys and $F (2,42)= .02, P>.05$ for subsample girls. This revealed that there was no significant difference in the mean pretest scores of the three groups for total sample and subsample based on gender.

Result of Analysis of Variance of Academic Stress Posttest Scores for Total Sample and Subsample based on Gender

The analysis of variance conducted to compare the mean posttest scores of three groups (Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group) showed significant difference in the scores of Academic Stress $F(2, 87) = 40.09, P<.01$ for total sample and $F (2,42) = 20.87, P<.01$ for subsample boys and $F (2,42) = 29.11, P<.01$ for subsample girls. This revealed that there was significant difference in the mean post test scores of the three groups for total sample and subsamples based on gender.

The post hoc analysis carried out showed that all the three groups differ significantly.
Result of group wise comparison of mean pretest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group and Control Group

Mean difference analysis conducted to find out mean difference showed that for total sample the mean difference of Academic Stress for Bibliotherapy Group and Progressive Muscle Relaxation Group, \( t(58) = 0.10, P>.05 \), for Bibliotherapy Group and Control group, \( t(58) = .12, P>.05 \) and for Progressive Muscle Relaxation Group and Control group \( t(58) = 0.03, P>.05 \). This showed that there exist no significant difference in the mean pretest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group, Bibliotherapy Group and Control group and Progressive Muscle Relaxation Group and Control group.

For subsample boys the mean difference of Academic Stress for Bibliotherapy Group and Progressive Muscle Relaxation Group, \( t(28)= .86, P>.05 \), for Bibliotherapy Group and Control group, \( t(28)= .02 \) and for Progressive Muscle Relaxation Group and Control group \( t(28) = .10, P>.05 \). This also showed that there was no significant difference in the mean pretest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group, Bibliotherapy Group and Control group and Progressive Muscle Relaxation Group and Control group for subsample boys.

For subsample girls the mean difference of Academic Stress for Bibliotherapy Group and Progressive Muscle Relaxation Group, \( t = (28) = .19, P>.05 \), for Experimental and Control group, \( t (28)= .15, P>.05 \) and for Progressive Muscle Relaxation Group and Control group, \( t(28)= .05, P>.05 \). This showed that for subsample girls also there was no significant difference in the mean pretest scores of Academic Stress.
Result of Comparison of Mean Pretest and Posttest Scores of Academic Stress for the Three Groups Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group

The result of paired t-test conducted to compare the mean pretest and posttest scores of Academic Stress of the Experimental group given Bibliography for total sample, \( t(29) = 13.50, P<.01 \) and for subsample Boys \( t(14) = 12.32, P<.01 \) and for subsample girls \( t(14) = 7.73, P<.01 \) showed that there existed significant difference in the mean pretest and posttest scores. This revealed that Bibliotherapy is effective in reducing the Academic Stress of the samples.

The result of paired t-test conducted to compare the mean pretest and posttest scores of Academic Stress of the Experimental group given Progressive Muscle Relaxation Exercise for total sample \( t(29) = 7.12, P<.01 \) and for subsample boys \( t(14) = 5.05 < .01 \) and for subsample girls \( t(14) = 5.39, P<.01 \) showed that there existed significant difference in the mean pretest and posttest scores of Academic Stress. This revealed that Progressive Muscle Relaxation is effective in reducing the Academic Stress of the sample.

The result of paired t-test conducted to compare the mean pretest and posttest scores of Academic Stress of the Control group given no intervention, for total sample \( t(14) = 1.12, P>.05 \) for subsample \( t(14) = .40 P>.05 \) and for subsample girls \( t(14) = 1.17, P>.05 \) showed that there existed no significant difference in the mean pretest and posttest scores for the samples.

Comparing the mean posttest scores on Academic Stress on Bibliotherapy Group and Progressive Muscle Relaxation Group and Control group

Mean difference analysis conducted to find out the mean difference showed that for total sample the mean difference of Academic Stress for
Bibliotherapy Group and Progressive Muscle Relaxation Group, \( t(58) = 3.74, P<.01 \), for Bibliotherapy Group and Control group \( t(58) = 8.99, P<.01 \) and Progressive Muscle Relaxation Group and Control group \( t(58) = 4.95, P<.01 \). This showed that there exist significant difference in the mean test scores of Bibliotherapy Group and Progressive Muscle Relaxation Group and Bibliotherapy Group and Control group and Progressive Muscle Relaxation Group and Control group.

For subsample boys the mean difference of Academic Stress for Bibliotherapy Group and Progressive Muscle Relaxation Group, \( t(28) = 3.42 \) and for Bibliotherapy Group and Control group \( t(28) = 6.29 \) and for Progressive Muscle Relaxation Group and Control group, \( t(28) = 2.94, P<.01 \). This showed that there exist significant difference in the mean posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group, Bibliotherapy Group and Control group, and Progressive Muscle Relaxation Group and Control group.

For subsample girls the mean difference of Academic Stress for Bibliotherapy Group and Progressive Muscle Relaxation Group, \( t(28) = 3.05 \) and for Bibliotherapy Group and Control group \( t(28) = 6.26 \) and for Progressive Muscle Relaxation Group and Control group, \( t(28) = 4.80, P<.01 \). This showed that there exist significant difference in the mean posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group, Bibliotherapy Group and Control group, and Progressive Muscle Relaxation Group and Control group.
Comparison of Mean Gain Scores of Academic Stress for the three groups Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group.

The result of mean difference analysis of the gain scores when compared for Bibliotherapy, for total sample $t(58) = 3.00$, $P<.01$ and for subsample boys $t(28) = 4.12$ and for subsample Girls $t(28) = 8.47$, $P<.01$ showed that there existed significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group and Progressive Muscle Relaxation Group.

The result of mean difference analysis of the gain scores when compared for Bibliotherapy and control group for total sample $t(58)= 13.19$, $P<.01$ and for subsample Boys $t(28) = 12.18$, $P<.01$ and for subsample girls $t(28)= 7.52$, $P<.01$ and for subsample girls $t(28)= 7.52$, $P<.01$ showed that there existed significant difference in the mean gain scores of Academic Stress of Bibliotherapy Group and Control group.

The result of mean difference analysis of the gain scores when compared for Progressive Muscle Relaxation and Control group for total sample, $t (58) = 6.94<.01$ and for subsample boys $t (28)= 5.05$, $P<.01$ and for subsample girls $t (28) = 5.23$, $P<.01$ showed that there was significant difference in the mean gain scores of Academic Stress of Progressive Muscle Relaxation Group and control group.

**Result of Analysis of Covariance for Academic Stress with Pretest Scores of the Three Groups as Covariate**

Analysis of Covariance was used to know whether experimental groups and control groups differ significantly or not in terms of the dependent variable Academic Stress, when the pretest scores were controlled.
Bonferroni’s test of Post hoc comparison was employed after ANCOVA which showed significant t-value in comparison.

Comparing Bibliotherapy Group and Progressive Muscle Relaxation Group the result $F (1, 57) = 19.37$, $P<.01$, for Bibliotherapy Group and Control group of the result $F (1, 57) = 270.47$ $P<.01$ and for Progressive Muscle Relaxation Group and Control group the result $F (1, 57) = 27.47$ showed that there existed significant difference for the three groups when the pretest scores are controlled.

Bonferroni’s Test of Post-Hoc Comparison result showed significant t-value 6.22 for Bibliotherapy Group and Progressive Muscle Relaxation Group, 23.26 for Bibliotherapy Group and Control group and 10.71 for Progressive Muscle Relaxation Group and Control group which showed significant difference $(P<.01)$.

**Tenability of Hypotheses**

Tenability of hypotheses formulated for the study was verified in the view of the findings and commented below:

1) Hypothesis 1 states that “There is no significant difference in the pretest scores of Academic Stress of Secondary school students of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for.
   a) Total sample
   b) Subsample boys
   c) Subsample girls”

   Analysis of data revealed that significant difference was not there in the mean pretest scores of Bibliotherapy Group, Progressive Muscle
Relaxation Group and Control group for total sample and subsample based on gender (P>.05), hence the hypothesis was accepted.

2) Hypothesis 2 states that “There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control Group for

a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean posttest scores of Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group for total sample and subsample based on gender P< .01, hence the hypothesis was accepted.

3) Hypothesis 3 states that “There is no significant difference in between the mean pretest scores of Academic Stress of Secondary school students of Bibliotherapy Group and Progressive Muscle Relaxation Group for

a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean pretest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample and subsamples based on gender P>.05, hence the hypothesis is accepted.
4) Hypothesis 4 states that “There is no significant difference in the mean pretest scores of Academic Stress of Secondary school students of Bibliotherapy Group and Control Group for
a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean pretest scores of Bibliotherapy Group and Control group for total sample and subsample based on gender P>.05, hence the hypothesis was accepted.

5) Hypothesis 5 states that “There is no significant difference in the mean pretest scores Academic Stress of Secondary school students of Progressive Muscle Relaxation Group and Control Group for
a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean pretest scores of Progressive Muscle Relaxation Group and Control group for total sample and subsample based on gender P>.05, hence the hypothesis was accepted.

6) Hypothesis 6 states that “There is significant difference in the mean Pretest and Posttest scores of Academic Stress of Bibliotherapy Group for
a) Total sample
b) Subsample boys
c) Subsample girls”
Analysis of data revealed that significant difference exist in the mean pretest and posttest scores of Academic Stress of Bibliotherapy Group for total sample and subsample based on gender \( P < .01 \), hence the hypothesis was accepted.

7) Hypothesis 7 states that “There is significant difference in the mean Pretest and Posttest scores of Academic Stress of Progressive Muscle Relaxation Group for

a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean Pretest and Posttest scores of Academic Stress of Progressive Muscle Relaxation Group for total sample and subsample based on gender \( P < .01 \), hence the hypothesis was accepted.

8) Hypothesis 8 states that “There is no significant difference in the mean Pretest and Posttest scores of Academic Stress of Control group for

a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean Pretest and Posttest scores of Academic Stress of Control group for total sample and subsample based on gender \( P > .05 \), hence the hypothesis was accepted.
9) Hypothesis 9 states that “There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for
a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean posttest scores of Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample and subsample based on gender P<.01, hence the hypothesis was accepted.

10) Hypothesis 10 states that “There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group and Control Group for
a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean posttest scores of Bibliotherapy Group and Control group for total sample and subsample based on gender P<.01, hence the hypothesis was accepted.

11) Hypothesis 11 states that “There is significant difference in the mean posttest scores of Academic Stress between Bibliotherapy Group and Control Group for
a) Total sample
b) Subsample boys
c) Subsample girls”
Analysis of data revealed that significant difference exist in the mean posttest scores of Progressive Muscle Relaxation Group and Control group for total sample and subsample based on gender $P<.01$, hence the hypothesis was accepted.

12) Hypothesis 12 states that “There is significant difference in the mean gain scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for

a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean gain scores of Academic Stress between Bibliotherapy Group and Progressive Muscle Relaxation Group for total sample and subsample based on gender $P<.01$, hence the hypothesis was accepted.

13) Hypothesis 13 states that “There is significant difference in the mean gain scores of Academic Stress between Bibliotherapy Group and Control group for

a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean gain scores of Academic Stress between Bibliotherapy Group and Control group for total sample and subsample based on gender $P<.01$, hence the hypothesis was accepted.
14) Hypothesis 14 states that “There is significant difference in the mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control Group for
a) Total sample
b) Subsample boys
c) Subsample girls”

Analysis of data revealed that significant difference exist in the mean gain scores of Academic Stress between Progressive Muscle Relaxation Group and Control Group for total sample and subsample based on gender P<.01, hence the hypothesis was accepted.

15) Hypothesis 15 states that “There is significant difference in the adjusted mean scores of Academic Stress of Secondary school students between Bibliotherapy Group, Progressive Muscle Relaxation Group and Control group by considering pretest scores as co-variate”.

The adjusted F value of dependent variable between Experimental Groups and Control group by considering pretest scores as co-variate is significant (P<.01). Hence the hypothesis was accepted.

**Conclusion**

From the survey conducted it was found that students generally feel stress regarding their academics. The survey revealed the need for stress management interventions. Most of the teachers and most of the students who participated in the survey strongly recommended for stress management intervention to be included in schools. So understanding the scenario the
The investigator selected two interventions which can be administered among school students.

The two intervention selected were Bibliotherapy and Progressive Muscle Relaxation and the Objective of the study was to find out the effectiveness of Bibliotherapy and Progressive Muscle Relaxation in reducing the Academic Stress of students. The difference between the groups were also analyzed using mean difference analysis. Comparison of the mean pretest scores revealed that all the groups, is almost equal before giving the treatments. Comparing the posttest scores revealed that all three groups significantly differ in their posttest scores emphasizing the effectiveness of Bibliotherapy and Progressive Muscle Relaxation in lowering the Academic Stress of students. From the mean scores it is also evident that Bibliotherapy is more effective than Progressive Muscle Relaxation in lowering Academic Stress.

The test of effectiveness by comparing mean pre and posttest scores revealed significant difference which emphasized the effectiveness of Bibliotherapy and Progressive Muscle Relaxation. Here also the mean scores shows that Bibliotherapy is more effective than Progressive Muscle Relaxation. The mean gain score comparison also revealed the effectiveness of Bibliotherapy and Progressive Muscle Relaxation. The effect size found by calculating Cohen’s d showed large effect size emphasizing the effectiveness of Bibliotherapy and Progressive Muscle Relaxation for Total sample and subsamples. The result of ANCOVA and successing Post Hoc Analysis showed that considering pretest scores as covariate there existed significant
effect for Bibliotherapy and Progressive Muscle relaxation in lowering the Academic Stress of Students.

From all these results it can be concluded that stress management interventions in school contexts are effective in helping the students cope with their academic stress.

**Educational Implications**

The study revealed that secondary school students are under considerable stress. Most of the students, teachers and parents were not able to identify these stress and the source of their stress. There stress arise from different domains such as personal, familial, school, peer, community etc. By using, certain intervention we can help students cope with their stress. In the present study Academic Stress was considered and two interventions namely Bibliotherapy and Progressive Muscle Relaxation was administered to help the students cope with their stress. From the result of the present study it is recommended that:

Teachers and parents can be empowered first to cope with their stresses so that it will be easy for them to identify the stress of the children whom they have to take care.

By helping the teachers reduce their stress they can be relaxed and that will improve their efficiency as a teacher. They can identify their students problem and can find remedial measures.

Giving the teachers training in stress management interventions, schools can effectively make use of these resources and improve the mental
health of the children. Good mental set up is inevitable for successful education. Some of the schools make use of relaxation techniques like yoga with special trainers. Along with this simple methods which can be managed by teachers who understand their students well will be more effective for helping the students. In the case of Bibliotherapy it is very easy for teachers to find out stories and help the students cope with their problem using these stories, for children are always interested in hearing stories.

Teachers especially language teachers can easily select stories which have bibliotherapeutic effect. There is no need for a particular time to give such stories to the children. Almost all the children will be focusing similar problems and if there will be any other problem for individual students it can be easily detected and remedial measures can be taken.

In the present era it is very essential to have such stress management programmes in schools to help the students for a bright and good future.

**Suggestions for Further Research**

Though the study revealed effectiveness of bibliotherapy and Progressive Muscle Relaxation in helping the students cope with their Academic Stress further research can be conducted in these areas.

- The combined effect of the two intervention can be done
- The samples can be selected from other locales for change in localities may change the environment which causes stress.
- Use the interventions to reduce other stressors affecting the students.
- The academic performance of students who have undergone such intervention can be analyzed as a further research.

- A study can be conducted by taking engineering and medical students as sample.

- It can be conducted among secondary and higher secondary school teachers.