Chapter-V

SUMMARY CONCLUSION & RECOMMENDATIONS

Summary

The present study undertaken by the research scholar is an attempt to construct a comprehensive exercise program for cardiac patients. The purpose of this study was:

1. To precisely find out beneficial effects of comprehensive exercise program on Coronary Artery Disease (CAD) risk factors.

2. To design a comprehensive exercise program selecting and considering the effect of exercises, which are safe, useful and practical for manifest Coronary Artery Disease.

3. To identify and improve social-psychological aspect of their life and to find out whether exercise program will have any other beneficial by-products of the program like, effect on the functional capacity, efficiency level, social acceptance and self concept.

4. To compare and relate the effect of exercise program on both groups experiment and control respectively.
Total 200 subjects with known CAD (proven blockages either with Tread Mill Test (TMT) or coronary angiogram) in Angina-I and Angina-II group (based on the guidelines of NYHA), were selected as subjects at Saaol Heart centre, New Delhi. The subjects were equally divided into two groups (one experiment and one control group). Each group consisted of 100 subjects.

This age group bracket was chosen, as it is the most common age of getting the heart problem. The study was conducted only on males since Heart Disease is much more common in males as compared to females (10:1).

According to the relevance and nature of the study the following variables were selected.

**Biochemical Variables:**

1. Blood Lipid Profile: - Cholesterol, Triglyceride, LDL, HDL

**Physiological Variables:**

TMT: Distance, Duration, Maximum Heart Rate (MHR),

Blood Pressure: Systolic, Diastolic, Pulse Rate

**Physical Variables:** Height, Weight, BMI

**Psychological Variables:** Level of State and Trait Anxiety
The comprehensive exercise/lifestyle modification program was consisting of five segments as follows:

1. Education,
2. Diet Management/Dietary suggestions,
3. Walking,
4. Health Rejuvenating Exercises,
5. Asanas (Flexibility Exercises),
6. Meditation,
7. Stress management Counselling.

1. Education Segment: In this segment subjects were oriented to the program of health awareness relevant to CAD associated important information.

2. Diet Management/Dietary suggestions: The subjects were taught to consume/ a Very Low Fat Diet (VLFD) or zero visible oil diet for best results. Relevant information in relation to nutrition and diet were made available to the patients.

3. The segment of walking, Health Rejuvenating Exercises, Asanas, meditation were comprehensively planned with most appropriate selective exercises and individualised load planning
on the basis of several experimentation, load evaluation and monitoring.

4. Stress management: Subjects were explained about the Type-A and Type-B behaviour and given a (counselling) session on stress management techniques.

The exercise program included:

<table>
<thead>
<tr>
<th>Type of Workout</th>
<th>Angina-I Time in (minutes)</th>
<th>Angina-II Time in (minutes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walk</td>
<td>30 minutes</td>
<td>20 minutes</td>
</tr>
<tr>
<td></td>
<td>(minimum)</td>
<td>(minimum)</td>
</tr>
<tr>
<td>Kayotsarg</td>
<td>15 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td>(minimum)</td>
<td>(minimum)</td>
</tr>
<tr>
<td>Health Rejuvenating</td>
<td>15 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td>Exercises (Callisthenics)</td>
<td>(minimum)</td>
<td>(minimum)</td>
</tr>
<tr>
<td>Yogic</td>
<td>8 x 5 reps</td>
<td>4 x 5 reps</td>
</tr>
<tr>
<td>(Flexibility)Exercises</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preksha Meditation</td>
<td>15 minutes</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td>(minimum)</td>
<td>(minimum)</td>
</tr>
</tbody>
</table>

The frequency of exercise program was 3 days a week in the beginning and was increased gradually. Patients begin to workout the whole week by the end of third month.
The very first component of the program was walking. Participants had to walk within their comfortable limits. Duration, intensity, speed/pace of walking was individualised according to individual patient condition and body response. They were taught to check their pulse rate and to calculate Target Heart Rate (THR) so that they remain in their THR zone. They were also explained the talk test to keep their speed at optimum and safe.

Angina-I group was given the walk for a minimum of 30 minutes according to their THR, whereas Angina-II group walked for minimum 20 minutes according to their THR.

Next was HRE (Heart Rejuvenating Exercises). Subjects were taught HRE, which are simple isotonic exercises, including rotation of joint, bending and stretching exercises. Participants had to perform HRE according to their own performance capacity and THR zone.

HRE was followed by a meditation called 'Kayotsarg' meant for 5 minutes relaxation period. The subjects performed the meditation under the supervision of an expert in the presence of the scholar.

Kayotsarg was followed by yogasanas (flexibility exercises). Eight exercises were given to Angina-I patients over the period of
three months. Only two standing stretching exercises (Upward stretching & forward bending toe touch) were introduced by third week and by fifth week two sitting exercises (Sasankasana, sitting with knees folded and forward bending arms straight up and forehead on the ground & seated waist twisting) were being introduced and practised. By the seventh month 4 exercises, two in supine lying position (uttan paddasana & straight leg raises (both legs)) and two in prone lying (Snake pose and straight one leg raise) position respectively.

For Angina-II group, flexibility exercises were introduced after the completion of first month. They were given only one exercise in each position introduced gradually over a period of two weeks and practised.

Preksha meditation was given at the end of the exercise session by an expert under the supervision of scholar and cardiologist for a minimum of 15 minutes for the relaxation and for the management of physical as well as all other stresses.

The control group was kept under control without any specific instructions. They consulted the Doctor and usual advice and medicine was given to them.
The data pertaining to selected variables were collected before administration of experimental program by a pre-test and at the end of six month of experimental program the post test data were collected for both the groups. All the data of selected variable was collected in SAAOL Heart Center, New Delhi, and selected diagnostic labs of India. Data pertaining to state and trait anxiety was collected by administering the questionnaire.

All collected data were subjected to statistical analysis relevant to purpose of the study. The data were subjected to t-ratio test and Analysis of Co-Variance (ANCOVA) to find out the significance of difference between post test values of experimental and control group so as to find out the effect of comprehensive exercise and lifestyle modification program on experimental group. The level of significance for the statistical analysis was kept at .05.

Graphical presentation was also made to readily compare the findings in all the selected variables.
Conclusion

From the analysis and findings of the study and critical comparisons with existing facts and as well as literature, research scholar would like to offer following conclusions:

1. Exercise program for old age CAD patient must include specific exercises in terms of duration, nature, and intensity with careful consideration to preliminary diagnosis, elaborate exercise testing under physician supervision.

2. Comprehensive exercise/lifestyle modification program significantly reduces the various heart risk factors among old age patients especially following risk areas:
   a. Significantly reduces cholesterol
   b. Significantly increases HDL
   c. Significantly decreases LDL
   d. Significantly reduces weight
   e. Significantly regulated as normalised blood pressure

3. Comprehensive exercise/lifestyle modification program significantly improved physical fitness and working capacity of old age patients.

4. On the basis of above findings and conclusions drawn from this study, the research scholar is of firm opinion that
a. Exercises significantly benefits old age cardiac patients. It reduces every form of risk factor of heart diseases.

b. Exercises improve physical fitness and working capacity of old cardiac patient.

c. It is practically quite possible to prescribe special exercise program, which are safe, useful & practical for old age heart patient

5. To effect best preventive and rehabilitative benefits for CAD patients of old age exercise program must include following aspect:

   a. Health awareness

   b. Walking

   c. HRE

   d. Meditation

   e. Yogic Asanas

   f. Diet and stress management.
Recommendation

In the light of the conclusion drawn, the following recommendations are made:-

1. It is recommended that to effect best preventive and rehabilitative benefits for CAD patients of old age exercise program must include following aspect:
   a. Health awareness
   b. Walking
   c. Health Rejuvenating Exercises
   d. Meditation
   e. Yogic Asanas
   f. Diet and stress management.

2. For CAD patients exercise load should be objectively planned on the basis of NYHA guidelines and individualised accordingly.

3. Comprehensive exercise/lifestyle modification program must be based on holistic approach and should take into consideration exercise, diet awareness and behavioural modifications.
4. The comprehensive exercise and lifestyle modification program adopted in this study can also be used for old age patients of hypertension, obesity, diabetes.

5. This exercise and lifestyle package may be utilised findings of the present study may be utilised by Doctors, health care workers, health educators, teachers, patients, etc., to keep a check on modifiable risk factors to prevent CAD.

6. Comprehensive exercise and lifestyle modification program may serve as alternative to bypass surgeries and other invasive procedures to great extent.

7. A research study at larger proportion in similar way may be conducted.

8. Studies may be carried out for different age groups and sex to evaluate the effect of Comprehensive exercise/lifestyle modification program.

9. Similar type of Comprehensive exercise/lifestyle modification program can be develop for people with other lifestyle diseases like, Diabetes, Asthma, osteoporosis, arthritis, back pain, etc.
10. The similar study may be done at patients recovering from a cardiac event or any other disease.

11. Based on the guidelines of this study, another study may be conducted on a single variable or each variable separately.

12. Similar study may be done on patients with other associated diseases.

13. A research study using various socio-economic status, and other lifestyle factors may be conducted.