CHAPTER - VI
SUMMARY, RECOMMENDATIONS AND LIMITATIONS

6.1. Summary of the study

Heart failure is increasingly recognized as a major public health problem in industrialized countries. Chronic heart failure presents a major clinical and financial burden for the NHS, one which is likely to increase considerably in the future. It is generally recognized that treatment of patients with chronic HF has only two main goals: to improve quality of life and to prolong life. Quality of life is relatively a new scientific measure to evaluate effectiveness of treatment strategies and the course of a disease. Information on the quality of life of patients with severe HF is scarce.

Realizing this fact, the investigator instituted the structured teaching on cardiac rehabilitation and a book-let on “Healthy way to Healthy Heart” to improve the quality of life of the patients with heart failure. The purpose of the current study was to assess the effect of nurse-led cardiac rehabilitation on adherence and quality of life among heart failure patients admitted in Cardiology Ward at Sri Ramachandra Medical Centre, Porur, Chennai. The objectives were to determine the effect of nurse-led cardiac rehabilitation on adherence and quality of life, to correlate the adherence with quality of life and to associate the level of adherence and quality of life with background variables.
An extensive review of related literature for the study was done, which helped the investigator to identify, select and critically analyze the existing information of the problem selected for the study. The conceptual framework for the study was based on modified Pender’s health promotion model.

The true experimental study design was adopted for this study. The setting of the study was Cardiology Wards of Sri Ramachandra Medical Centre, Porur, Chennai. Patients diagnosed to have chronic heart failure with NYHA type II and III; EF ≤ 40% and age group of >30 years were recruited for the study by using simple random sampling method. Patients posted for cardiac surgery, on ventricular assistive devices were excluded from the study. The tool used for data collection included background variables, biophysiological parameters, Dutch knowledge on heart failure to assess the level of knowledge on heart failure, modified heart failure compliance scale to assess the adherence behavior to cardiac rehabilitation, 6 minute walk test to assess the functional capacity of the study participants, short form 36V2 to assess the generic quality of life and Minnesota living with heart failure scale to assess the disease specific quality of life among patients with heart failure. Totally 200 patients were recruited based on inclusion criteria. 100 were randomly assigned to both the experimental and control groups for the main study. A pilot study was conducted to assess the feasibility of the study.

A book-let developed by the investigator on “Healthy way to Healthy Heart” was provided to the study group on the day of discharge after the pretest assessment and structured teaching on cardiac rehabilitation. Study group were
taught on the disease condition, medication, salt restricted diet, fluid restricted diet, daily weight-check, exercise, smoking cessation and lifestyle modification components were taught on an individual basis.

The posttest on adherence to cardiac rehabilitation and quality of life were assessed on their follow up after one month and after 3 months of discharge from the hospital. Both descriptive and inferential statistics were used to test the hypotheses.

6.2. Major findings of the study

1. The overall level of knowledge on heart failure mean score in the study group and control group in posttest-2 were 10.38 ± 1.37 and 8.58 ± 1.63 respectively.

2. The level of knowledge on heart failure was increased in the study group from the pretest to the posttest-2. The paired ‘t’ test value was 20.00 and this was statistically significant at the level of p <0.001.

3. The ‘t’ test revealed a significant difference in the level of knowledge on heart failure between the study group and control group both in posttest-1 and posttest-2 at p <0.001 level.

4. The repeated measure ANOVA on level of knowledge revealed a significant difference between the study and control group at p <0.001.
5. The study group participants were adherent to appointment keeping, medication, salt restricted diet, fluid restriction and smoking cessation components of cardiac rehabilitation in the posttest-2.

6. The adherence to cardiac rehabilitation was increased in the study group from pretest to posttest-1 and posttest-2. The paired ‘t’- test value was 4.07 and 8.58 respectively and it was significant at p < 0.001 level.

7. Compared to control group, the study group adherence to cardiac rehabilitation was good, the t- value was 3.18, 3.47 and 4.81 in pretest, posttest-1 and posttest-2 respectively and this was statistically significant at the level of p < 0.001.

8. The repeated measure ANOVA on adherence to cardiac rehabilitation revealed no significant difference between the study and control groups.

9. The 6 minute walk test mean score of patients in the study group was 233.41±77.64, 255.67±72.11 and 287.37±61.64 at pretest, posttest-1 and posttest-2 respectively and this was significant at p < 0.001 level.

10. Study group had significant increase in walking distance when compared to control group. The 't' test was 1.96 and this was statistically significant at the p < 0.05.

11. The repeated measure ANOVA on 6 minute walk test revealed a significant difference between the study and control group at p < 0.001.
12. Paired 't' test showed a statistically significant difference in terms of BMI, diastolic blood pressure at p < 0.05 level, whereas RBS, Sr.sodium and potassium level was significant at p < 0.01 level in study group at posttest-1.

13. Paired ‘t’- test showed a statistically significant difference in terms of BMI, diastolic blood pressure and triglyceride at p <0.05 level , whereas LDL was significant at p < 0.01 level and HDL, RBS, Sr.sodium was significant at p < 0.001 level in study group at posttest-2.

14. Compared to control group, the study group had normal biophysiological parameters at posttest-1 in terms of systolic blood pressure and this was statistically significant at the level of p <0.05, whereas diastolic blood pressure was significant at p < 0.01 level.

15. Compared to control group, study group had normal biophysiological parameters at posttest-2 in terms of hemoglobin which was significant at p < 0.05 level, whereas RBS was significant at p < 0.01 level. Diastolic blood pressure, HDL, Sr. Sodium and Sr.Pottasium was significant at p <0.001 level.

16. The mean physical component summary of the study group was 33.69, 43.67 and 46.53 in the pretest, posttest-1 and posttest 2 respectively which was significant at p < 0.001 level.
17. The physical component summary was increased from pretest to posttest-2 in the study group. The t-test was 2.23 and this was statistically significant at the p <0.05 level.

18. The repeated measure ANOVA on physical component summary revealed a significant difference between the study and control group (F=5.346 p=0.022).

19. The mean mental component summary was 7.05 and 8.39 in the posttest-2 and between posttest-1 to posttest-2 respectively in the study group, and this was significant at p < 0.001 level.

20. The mental component summary was increased from pretest to posttest-2 in the study group. The t-test was 11.17 and this was statistically significant at the p value <0.001 level.

21. The repeated measure ANOVA on mental component summary revealed a significant difference between the study and control groups (F=42.65 p=0.001).

22. The disease specific health related quality of life was increased from pretest to posttest-1 and posttest-2 in the study group. The paired ‘t’ test was 5.08 and 6.77 respectively and this was statistically significant at the p value <0.001 level.
23. The disease specific health related quality of life was increased in posttest-1 and posttest-2 and the t-value was 2.19 and 5.92 respectively which was significant at p < 0.05 and p < 0.001 level respectively.

24. The repeated measure ANOVA on disease specific quality of life revealed a significant difference between the study and control group (F=12.262 p=0.001).

25. There was a positive correlation between knowledge and quality of life in posttest-2 in the study group.

26. There was a positive correlation between adherence and generic health related quality of life in posttest-2, whereas a significant positive correlation between adherence and disease specific quality of life in the posttest-2 and this was significant at p < 0.01 in the study group.

27. There was a positive correlation between 6 minute walk test and quality of life in posttest-2 in the study group.

28. The data revealed that the association between the level of knowledge, adherence, 6 minute walk test score, physical component summary and mental component summary with demographic variables were not having significant association, whereas the disease specific quality of life has significant association with education and occupation at p < 0.05 and p < 0.01 respectively.
29. The data revealed that the association between the level of knowledge and adherence score with demographic variables were not having significant association.

30. The data revealed that the association between 6 minute walk test score with clinical variables was not having significant association, except the diagnosis and NYHA has significant association with 6 minute walk test at p < 0.001 and p < 0.05 respectively.

31. The data revealed that the association between 6 minute walk test, physical component summary and mental component summary had significant association with diagnosis which was significant at p < 0.01.

32. There was a statistical association between disease specific quality of life with NYHA at p < 0.05 level.

33. The regression analysis showed that knowledge was associated with religion at p <0.05 level.

34. Six minute walk test was associated with gender and use of tobacco at p < 0.01 and p < 0.05 respectively, whereas NYHA and EF also had significant association with 6 minute walk test which was significant at p < 0.01 and p < 0.05 respectively.

35. The regression analysis revealed that age and occupation were related significantly to physical component summary, whereas educational and marital status were related to mental component summary at p < 0.01 level.
36. The regression analysis revealed that gender, education and occupation were related significantly with disease specific quality of life at $p < 0.01$ level.

6.3. Conclusion

The study conclusions are

1. Structured teaching on heart failure enhances the level of knowledge on heart failure and its management.

2. Nurse-led cardiac rehabilitation improves the adherence behavior among patients with heart failure.

3. Cardiac rehabilitation is an effective intervention in improving the generic as well as disease specific health related quality of life among patients with heart failure.

4. Disease specific health related quality of life has significant association with age, educational status and occupation.

Based on the study findings it is concluded that the combination of interventions like structured teaching, information booklet on cardiac rehabilitation and telephone reinforcement are capable of increasing the adherence behavior to cardiac rehabilitation and thereby improving the quality of life among patients with heart failure.
6.4. Implications of the study

The present study has implications in Nursing practice, Education, Administration and Research.

6.4.1. Nursing Practice

The nurses working in hospitals, clinical and community settings could administer nurse-led cardiac rehabilitation program for patients with Heart failure. The booklet on cardiac rehabilitation developed by the investigator may be used to educate, and instruct the patients with heart failure. Continuous practice of rehabilitation program may be advised to maximize physical, psychological and social functioning. Six minute walk test can be used as an objective measurement to measure the functional capacity.

Clinical nurses could encourage for group sessions to learn about adherence strategies to follow systematically, continuously and daily. These patients can be encouraged to continue their self help group support even after hospitalization. Nurses have close contact not only with patient and also with patient family members. Utilizing that opportunity nurses could involve family members to enhance their knowledge on treatment adherence and its important contribution to improve the quality of life.

Nurses could schedule family involvement programs which would pave a way for deinstitutionalized cardiac rehabilitation and cost effective.
6.4.2. Nursing Education

Research evidences are highly supportive for the holistic approach to cardiac rehabilitation for patients with heart failure. Six minutes walk test is one of the important objective measurements of functional capacity of patients with heart failure. Integration of 6 minute walk test into the nursing curricula would benefit the nursing students themselves. They in turn apply in the clinical practice for the benefit of the patients.

Curricula can be modified for nursing students and primary health care providers incorporating extensive rehabilitation components to take care of heart failure patients in the tertiary hospital and in the community settings. Nursing students may be encouraged to use 6 minute walk test in the clinical setting. Continuing nursing education program on cardiac rehabilitation can be organized for nurses in the clinical setting.

Indian nursing council had established post certificate diploma course on cardiothoracic nursing where cardiac rehabilitation by nurses is highly emphasized. The book-let prepared for the present study on “healthy way to healthy heart” can form an important guidelines for nursing students to plan for health education to cardiac patients.

6.4.3. Nursing Administration

The nurse administrator can formulate policies and protocols on cardiac rehabilitation program with research evidence. They can concentrate on placement and effective utilization of the nurses and to allow them for creativity, interest and
ability to rehabilitate the patients with heart failure. They can establish a cardiac rehabilitation unit for patients with heart failure and can collaborate with heart failure clinic team members. They can arrange telenursing conferences for nursing service personnel and for students of nursing education with national and international institutions.

The incorporation of this structured teaching on cardiac rehabilitation can potentially benefit patients as well as nurses while at the same time reduce the health care costs both for the patients as well as for the institutions. The book-let on healthy way to healthy heart can be provided for all the patients with heart failure.

Nurse administrator can collaborate with health care team members in the smooth running of the cardiac rehabilitation unit.

To improve quality of services given to patients with heart failure updating the nurses knowledge on cardiac rehabilitative measure is essential. Nurse administrators can organize educational programs such as short term course, refresher course, seminar, workshop and conferences to update the nurses. Field trips to various cardiac rehabilitation centers of various organization could be organized by nursing administrator to widen the outlook of nurses role in cardiac rehabilitation.

6.4.4. Nursing Research

Nurse researchers can carry out systematic review to develop evidence-base to formulate cardiac rehabilitation strategies. Adequate financial support,
motivation and encouragement by the organization can enable various research activities. Research related to rehabilitation is a need of the hour, since the technological advancement and medication has improved the survival rate of the patients with heart failure. Explorative study can be encouraged to find out the learning needs of patients with heart failure and their care givers’ burden.

Conducting research with no communication of research findings is equal to non conduct of research only. Instead, nurse researcher should utilizes various opportunity to communicate research findings either in oral form or in written form. Dissemination of research findings is prerequisite for implementation of research findings in nursing practice.

6.5.  Limitations

1.  The investigator and the study participants were aware of the group status. Hence, there was possibility of effect of treatment coming into play on which investigator had no control.

2.  The investigator had no influence on the social desirability contributing their health behavior such as smoking behaviour among patients with heart failure.

3.  The investigator had no influence in getting the weighing machine to weigh them daily.

4.  This study is applicable to a specific population that is patients with heart failure.
5. The study group and control group were from same setting, hence, there was a possibility for contamination.

6. Both pilot study and main study was done in the same setting.

7. The study findings are generalizable only to few hospitals.

6.6. Recommendations

1. Qualitative and lived in experience of patients with heart failure can be researched to have a better understanding of the problem.

2. A comparative study can be done between home based and in patient cardiac rehabilitation.

3. Long term follow up study after cardiac rehabilitation in patients with heart failure could be done for sustaining the benefits.

4. The study can also be replicated in different cultural groups, urban areas and larger samples in different settings.

5. A similar study can be conducted as a video assisted teaching program with adequate follow up.

6. The combination of biophysiological parameters and other psychosocial interventions can be investigated.

7. A multicenter study may be carried out with same interventions.
8. Phenomenology study can be done to find out the barriers for adherence to cardiac rehabilitation and find out the factors to overcome those barriers for adherence.

9. Interventional study to improve the compliance behavior can be done among heart failure patients.