CHAPTER V

DISCUSSION AND CONCLUSION
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MAJOR FINDINGS, DISCUSSION, CONCLUSION, IMPLICATIONS, LIMITATIONS AND RECOMMENDATIONS

This chapter presents a brief summary of research study, major research findings, discussion, and implications in the field of nursing, conclusion, strengths, limitations and recommendations for the future research studies.

SUMMARY

The purpose of the study was to evaluate the effectiveness of comprehensive nursing intervention programme (CNIP) for patients following CABG surgery in comparison to routine care in post-operative period.

The study was conducted at the department of cardiovascular and thoracic surgery, Kasturba Hospital, Manipal. Relevant literature was collected, systematic reviews and meta-analysis were conducted and presented in areas related to research study. Conceptual framework for this study was based on modified Health Promotion Model of Nola J. Pender (1996). The quantitative research approach and randomized controlled trial design was adopted. The samples for this study were patients undergoing coronary artery bypass graft surgery. Block randomization was used to allocate the patients into the experimental and control group.

Total sample size of the study was 130 (Experimental group - 65 & Control group - 65). The patients in the experimental group received CNIP (independent variable) and regular routine care of the hospital was received by the patients in the control group. The
main outcome measures (dependent variables) were anxiety measured by state-trait anxiety inventory, pain measured by visual analogue scale, fatigue measured by identity consequences fatigue scale, self-efficacy measured by Barnason efficacy expectation scale and quality of life measured by quality of life index - cardiac version IV.

Descriptive and inferential statistics were used. Descriptive statistics were used for describing the sample characteristics. Repeated measures ANOVA was used to determine the effectiveness of CNIP. Intention to treat (ITT) analysis was done by replacing the last recorded value (LOCF – last observation carry forward) for the lost to follow-up data. The results are discussed in the light of hypotheses.

MAJOR FINDINGS AND DISCUSSION

The following were the major findings of the study

Socio-demographic variables

The mean age of the patients was 57.62 (7.49) and 57.46 (8.49) respectively in the experimental group and control group. Concerning to gender, majority of the patients were male with 84.6% in the experimental group and 81.5% in the control group. Most of the patients were belongs to Hindu religion in the experimental (82.6%) and the control group (83.1%). Regarding the educational qualification, most of them (40%) had higher secondary education in the experimental group and 35.4% had primary education in the control group. Majority of them were skilled workers i.e. 56.9% in the experimental group and 56.9% in the control group.
In relation to physical activity, most of them were sedentary i.e. 63.1% in the experimental group and 73.8% in the control group. Almost half the patients in both the experimental group and control group had habits of smoking and drinking alcohol. Majority of them were non-vegetarians i.e. 64.6% in the experimental group and 73.8% in the control group. Most of the patients (78.5%) did not have habit of regular exercise in both the groups. Majority of the patients did not have family history of CAD in both the experimental and control group. Both the groups were similar in their socio-demographic characteristics (p > .05).

**Clinical variables**

Majority of the patients (70.08%) in the experimental group had the history of hypertension. Most of the patients (63.1%) had history of diabetes mellitus in both the groups. Many patients did not have history of heart attack in both the experimental (80%) and the control group (75.4%). Majority of the patients underwent off pump CABG surgery i.e. 80% in the experimental and 76.9% in the control group. The patients in both the experimental and control group had similar clinical characteristics (p > .05).

**Anxiety among patients undergoing CABG surgery**

The findings showed that mean score of trait anxiety in the experimental group and control group were 41.26 (9.42) and 40.13 (9.98) respectively, mean scores of the state anxiety in the experimental group and control group were 55.75 (5.75) and 54.87 (5.80) respectively. It shows that the patients in both the experimental group and control group experiences significant preoperative anxiety while undergoing CABG surgery. The study by Gallagher and McKinley (2007) in Australia reported that patients undergoing CABG
surgery experiences higher anxiety before surgery. Krannich et al. (2007) conducted a study on anxiety before and after CABG surgery in Germany and concluded that 34.0 % & 24.7 % of the patients were clinically anxious before and after the surgery respectively.

Level of state anxiety among patients undergoing CABG surgery revealed that, most of them had medium level of anxiety in the experimental group i.e. 81.5% and 87.7% in the control group. 16.9% of them in the experimental group and 9.2% in the control high level of anxiety respectively. The same result was identified in a study conducted at Iran by Fathi et al. (2014) where there was higher level of anxiety before the surgery among the patients following heart surgery. A cross sectional study conducted by Fitzsimons, Parahoo, Richardson and Stringer (2003) reported that patient’s experiences higher level of anxiety while waiting for CABG surgery in Northern Ireland. Some of the previous studies are also reported that patients following CABG surgery experiences anxiety before the surgery (Wray et al., 2004; Tsushima et al., 2005). Hence, there is a need for some targeted interventions to decrease anxiety among patients undergoing CABG surgery.

**Bio-Physiological parameters among patients who underwent CABG surgery**

Comparison of bio-physiological parameters demonstrated that there was a minimal difference in heart and respiration rate, oxygen saturation between the experimental and control group. There was nominal difference in systolic and diastolic blood pressure between the experimental and control group. The mean difference between the second and fifth postoperative day in systolic blood pressure were 5.55 and 1.73 respectively in the experimental and control group. The mean difference between the second and fifth
postoperative day in diastolic blood pressure was 2.17 and 0.62 respectively in the experimental and control group.

Second postoperative day mean scores of bio-physiological parameters of the experimental and control group did not differ significantly. The t test revealed that there was no significant difference between the experimental and control group at p<.05. Whereas on the fifth post-operative day there was a significant difference found in heart rate (p = .03), respiration rate (p=.01), systolic blood pressure (p=.02), diastolic blood pressure (p=.03) and oxygen saturation (p=.01).

**Effect of CNIP on anxiety among the patients who underwent CABG surgery**

Anxiety was measured by state-trait anxiety inventory. The repeated measures ANOVA between the experimental and control group revealed a higher statistical significance, $F(1,128) = 157.17$, $p =.001$, partial $\eta^2_p = .551$. Repeated measures ANOVA within the experimental group analysis showed a statistical significance $F(2.86,366.24) = 314.85$, $p< .001$, partial $\eta^2_p = .711$. The between group effect size of .551 represents moderate statistical significance between two groups and within group effect size of .711 shows the high statistical significance in the experimental group.

There was a greater reduction of anxiety in the experimental group over the time (pre-test to post-test 3 the mean difference was 26.38). The reduction was also consistent in the experimental group over the time. The mean difference in the control group from pre-test to post-test 3 was only 17.52. These results demonstrate that CNIP is effective in reducing the anxiety and improving the psychological wellbeing among the patients who underwent CABG surgery.
These findings are supported by the following previously published studies. A randomized controlled trial concluded that preoperative education significantly (p<.001) decreased anxiety among the patients who had cardiac surgery in China (Guo et al., 2012). A randomized controlled trial reported that information provided by the nurses was helpful and significantly (p<.001) reduced anxiety among the patients who underwent CABG surgery in Canada (Hartford, Wong, & Zakaria, 2002). The recent meta-analysis findings concluded that preoperative education is very effective in reducing anxiety among the patients who cardiac surgery (Ramesh et al., 2017).

A randomized controlled trial conducted by Bauer et al. (2010) reported that massage therapy significantly (p<.001) decreased anxiety among the patients who underwent cardiac surgery in the United States of America (USA). A randomized controlled trial concluded that massage therapy significantly (p<.001) reduced anxiety in the patients after cardiac surgery in Australia (Braun et al., 2012). The recent meta-analysis findings supports that massage therapy decreases the anxiety effectively in the post-operative period among patients who underwent CABG surgery (Miozzo, Stein, Bozzetto, & Plentz, 2016).

Contrary to the present study findings some of the previous studies reported that preoperative education and massage therapy did not decrease anxiety among cardiac surgery patients. A randomized controlled trial was conducted on impact of preoperative education and reported that education did not have any effect on anxiety among the patients after cardiac surgery in the United Kingdom (Shuldham, Fleming, & Goodman, 2002). A randomized controlled trial concluded that education intervention did not reduce
anxiety in the patients who underwent CABG surgery in Iran (Sharif, Shoul, Janati, Kojuri, & Zare, 2012). A randomized controlled trial reported that massage therapy did not decrease anxiety in the patients who underwent cardiac surgery in USA (Albert et al., 2009).

The reason might be because of the intervention administered for the patients in the previous studies was only one component either massage or preoperative education. Whereas the present study followed the comprehensive approach including both the components i.e. massage therapy and preoperative education as the intervention for the patients who underwent CABG surgery.

**Effect of CNIP on pain among the patients who underwent CABG surgery**

Visual Analogue Scale was used to measure the pain. Analysis of repeated measures ANOVA between the experimental and control group proved a statistical significance, $F_{(1,128)} = 68.5$, $p = .001$, partial $\eta^2_p = .349$. Repeated measures ANOVA within the experimental group analysis revealed a higher statistical significance $F_{(1,128)} = 2423.78$, $p < .001$, partial $\eta^2_p = .950$. The between group effect size of .349 represents moderate statistical significance between two groups and within group effect size of .950 shows the high statistical significance in the experimental group.

The reduction of pain scores observed from pre to post-test in the experimental group was at higher rate with mean difference of 39.54 whereas in control group the mean difference was only 28.16. The change in the experimental group was greater in post-test as compared to the control group, there was also reduction in pain scores in control group.
but it was less when compared to the patients in experimental group. This proves that CNIP is effective in minimizing the pain during the postoperative period after CABG surgery.

These results are in line with the previous randomized controlled trial conducted by Braun et al. (2012) on effect of massage therapy for cardiac surgery patients in Australia and concluded that patients who received massage intervention had significant (p<.001) reduction in pain. A randomized controlled trial reported that massage therapy significantly (p<.001) decreased pain among the patients who underwent cardiac surgery in USA (Bauer et al., 2010). A pilot randomized controlled trial was conducted on effect of educational intervention in Canada and concluded that there was a significant (p=.04) decrease in pain among the patients after cardiac surgery (Martorella et al., 2012). The recent findings of meta-analysis demonstrated that massage therapy significantly reduces the pain level in the post-operative period among patients who underwent CABG surgery (Miozzo et al., 2016).

However, some of the previous studies have reported that preoperative education and massage therapy did not decrease pain among the patients undergoing cardiac surgery. A randomized controlled trial conducted on impact of preoperative education reported that education did not have any effect on pain among the patients after cardiac surgery in the United Kingdom (Shuldham, Fleming, & Goodman, 2002). A randomized controlled trial reported that preoperative education did not reduce pain among the patients who had cardiac surgery in China (Guo et al., 2012). A randomized controlled trial concluded that massage therapy did not decrease pain among the patients who underwent cardiac surgery in USA (Albert et al., 2009). The reason may be as these studies evaluated only one component of intervention.
As per our knowledge this is the first study to explore the effectiveness of combined form of preoperative education and massage therapy among patients undergoing CABG surgery. The investigator believes that significant reduction of anxiety and pain among patients who underwent CABG surgery due to the effect of CNIP. We also believe that this is the first trial in Indian settings to our knowledge to check the effectiveness of combined form of preoperative education and massage therapy on postoperative outcomes among patients who underwent CABG surgery.

**Effect of CNIP on fatigue among the patients who underwent CABG surgery**

The immediate post-operative fatigue was measured on 2\textsuperscript{nd} POD and 5\textsuperscript{th} POD using Fatigue Visual Numeric (FVN) scale. Comprehensive fatigue was measured using Identity Consequences Fatigue Scale (ICFS) during the first and third month follow up in both the experimental and control group.

Decrease in fatigue scores in experimental group was from 7.28 (1.56) to 2.72 (1.16) whereas in control group from 7.15 (1.77) it reduced to 4.80 (1.60). There was a greater reduction of fatigue scores in the experimental group with mean difference of 4.56 from 2\textsuperscript{nd} post-operative day to fifth post-operative day, whereas in control group the mean difference was only 2.35. There are very limited evidence or published literature on any kind of intervention on postoperative fatigue among patients who underwent cardiac surgery. Considering this fact, findings of this research study contributes to the mounting body of knowledge in management of postoperative fatigue in post CABG patients.

Analysis of repeated measures ANOVA between the experimental and control group showed a statistical significance, $F(1,128) = 27.62$, $p = .001$, partial $\eta^2 = .200$. 
Repeated measures ANOVA within the experimental group analysis proved a higher statistical significance $F_{(1,128)} = 306.83$, $p< .001$, partial $\eta^2_p = .706$. The between group effect size of .200 represents small statistical significance between two groups and within group effect size of .706 shows the high statistical significance in the experimental group.

There was higher reduction in fatigue scores (ICFS) in experimental group decreased from 58.40(4.66) to 35.33 (7.17) whereas in control group from 62.24 (5.63) it reduced to only 52.11 (7.99). The reduction in fatigue scores observed from first month to third month in the experimental group was greater with mean difference of 23.10 whereas in control group the mean difference was 10.13. The change in the experimental group was greater during the third month follow up as compared to the control group, there was also reduction in fatigue scores in control group but it was not as much of the patients in experimental group.

Analysis of repeated measures ANOVA between the experimental and control group proved a statistical significance, $F_{(1,128)} = 164.70$, $p =.001$, partial $\eta^2_p = .563$. Repeated measures ANOVA within the experimental group analysis revealed a higher statistical significance $F_{(1,128)} = 420.72$, $p< .001$, partial $\eta^2_p = .767$. The between group effect size of .563 represents moderate statistical significance between two groups and within group effect size of .767 shows the high statistical significance in the experimental group. This suggest that CNIP is effective in decreasing the fatigue during the recovery period after CABG surgery.
These findings are supported by the previous study conducted by Zimmerman et al. (2007) on the effect of self-management intervention concluded that there was a significant (p<.05) reduction in fatigue scores among the patients after CABG surgery in USA. Another randomized controlled trial was conducted on effect of home recovery intervention and concluded that the intervention showed a positive results on fatigue among the patients after cardiac surgery in USA (Moore & Dolansky, 2001).

The findings of recent systematic review of massage therapy support the reduction of post-operative fatigue and improvement in the recovery among the patients who underwent cardiac surgery (Ramesh et al., 2015). In contrast to the present study findings, a study conducted in the United States of America by Lenz and Perkins (2000) reported that educational intervention did not have any effect on fatigue level among patients who underwent CABG surgery. As there are only limited number of studies explored the effectiveness of educational intervention on fatigue, the present trial adds more evidence for making clinical decisions using these type of interventions on the management of postoperative fatigue among patients who underwent CABG surgery.

**Effect of CNIP on self-efficacy among the patients who underwent CABG surgery**

Self-efficacy among patients who underwent CABG surgery was measured by Barnason Efficacy Expectation Scale (BEES). There was a greater increase in the self-efficacy from pre-test to post-test 2 in the experimental group with the mean difference of 23.91 whereas in control group the increase was only with mean difference of 5.29. The increase in self-efficacy in the control group was very less compared to the experimental group and it was not statistically significant.
Analysis of repeated measures ANOVA between the experimental and control group proved a statistical significance, $F_{(1,128)} = 389.19, p = .001$, partial $\eta^2_p = .753$. Repeated measures ANOVA within the experimental group analysis revealed a strong statistical significance $F_{(1.990,254.74)} = 580.87, p < .001$, partial $\eta^2_p = .819$. The between group effect size of .753 represents high statistical significance between two groups and within group effect size of .819 also shows the high statistical significance in the experimental group.

The experimental patients showed a significant increase in the self-efficacy scores compared with the control group. These findings prove that CNIP is very effective in increasing the self-efficacy among patients who underwent CABG surgery. Given the positive results this study contributes to the mounting body of knowledge in the nursing care patients undergoing CABG surgery.

These findings are consistent with previous studies that had evaluated effect of educational interventions in improving the self-efficacy among the patients who underwent cardiac surgery. A randomized controlled trial was conducted on effect of educational intervention among CABG surgery patients in Iran and reported that there was a significant ($p < .001$) improvement in cardiac self-efficacy after the surgery (Varaei et al., 2017). Prospective controlled study conducted in Germany reported that motivational education sessions significantly ($p < .001$) improved the self-efficacy among the patients who underwent CABG surgery (Krannich et al., 2008).

A randomized clinical trial reported that home communication intervention significantly ($p < .001$) improved self-efficacy among the patients after CABG surgery in
USA (Barnason et al., 2003). The prospective quasi-experimental study conducted in Turkey reported that discharge teaching and counselling significantly (p<.005) enhanced the self-efficacy of the patients after CABG surgery (Cebeci & Celik, 2008). A recent systematic review concluded that patient education is very important component of nursing care in improving self-care abilities at home after the discharge and CABG surgery (Fredericks, Ibrahim, & Puri, 2009).

**Effect of CNIP on quality of life among the patients who underwent CABG surgery**

The quality of life was measured by using the Quality of Life Index - Cardiac Version IV. The quality of life was evaluated during the first, third, and sixth month in both the experimental and control group. There was a constant and gradual increase in the quality of life was noted in the experimental group with the mean difference 6.37 from first month measurement to sixth month, whereas in the control group the mean difference was only 2.08. Increase in quality of life scores in experimental group increased from 21.74 (2.25) to 28.11 (2.72) whereas in control group from 20.26 (2.00) it increased to 22.34 (2.16).

The increase in quality of life in the experimental group was significant and higher in both the third and sixth month measurements as compared to the control group, there was also improvement in quality of life scores in control group in all the measures but it was not as much as changes happened in the experimental group. These findings prove that CNIP was very effective in improving the quality of life among patients who underwent CABG surgery.
Analysis of repeated measures ANOVA between the experimental and control group showed a higher statistical significance, \( F_{(1,128)} = 299.41, \ p = .001, \ \eta^2_p = .701 \). Repeated measures ANOVA within the experimental group analysis revealed a high statistical significance \( F_{(1.993,255.07)} = 102.88, \ p< .001, \ \eta^2_p = .576 \). The between group effect size of .701 represents high statistical significance and clinically significant difference between two groups and within group effect size of .576 also shows the moderate statistical and clinical significance in the experimental group.

There are research studies and evidence available on the effect of a single intervention on the quality of life compared to usual care but not many research studies conducted having more than one component or comprehensive interventional approach. This research study explored the comprehensive approach on quality of life among patients who underwent CABG surgery and gives insight on planning the nursing interventions in the comprehensive way to augment their recovery speed and improve the quality of life of the patients after a major heart surgery.

The present study findings are consistent with findings of previous studies. A randomized controlled trial reported that preoperative educational interventions significantly (\( p<.001 \)) improved the quality of life in the patients after CABG surgery in Canada (Arthur et al., 2000). A prospective quasi-experimental study conducted in Taiwan concluded that therapeutic life-style change programme significantly (\( p<.005 \)) improved the health outcomes among the patients after the CABG surgery (Lin, Tsai, Lin, & Tsay, 2010).
However, some of the previous studies concluded in contrast stating that these types of interventions did not have any effect on quality of life among the patients who underwent cardiac surgery. A randomized controlled trial on impact of preoperative education reported that education did not have any effect on well-being and recovery of the patients after CABG surgery in the United Kingdom (Shuldham, Fleming, & Goodman, 2002). A randomized controlled trial to evaluate a nurse-led programme among patients undergoing cardiac surgery was conducted in the United Kingdom and concluded that educational intervention did not improve the quality of life (Goodman et al., 2008).

**CONCLUSION**

Based on the findings of the study the following conclusions were drawn

1. Anxiety, pain, and fatigue are the common postoperative problems that affects the recovery process and quality of life of patients who undergo CABG surgery if appropriate interventions and measures are not taken.

2. The complex relationship between the physical, psychological and social health of the patients demands that nursing interventions for postoperative outcomes are rendered comprehensively.

3. Improved self-efficacy augments the self-management skills and results in the speedy recovery and higher quality of life patients who underwent CABG surgery.

4. Comprehensive Nursing Intervention Programme (CNIP) was found to be very effective in decreasing anxiety, pain, fatigue, and improving self-efficacy and quality of life among patients who underwent CABG surgery.
5. These trial results contribute to the growing body of knowledge on nursing management of post-operative outcomes among patients who had CABG surgery.

6. Findings of this study also contribute on generating evidence in the use of educational interventions, massage therapy and self-educational booklet for the patients who undergo major heart surgery.

7. Given the promising findings these interventions can be implemented by the nurses as nursing interventions to enhance the speedy recovery of the patients and reduce their sufferings.

**IMPLICATIONS**

The findings of this present trial have implications in various areas of nursing practice, nursing education, nursing administration and nursing research.

**Nursing Practice**

Nurses play an important role in taking care of the patients undergoing CABG surgery. Nurses need to give adequate attention on postoperative outcomes such as anxiety, fatigue, pain among patients undergoing CABG surgery and also aware that if these outcomes are not managed properly with appropriate nursing interventions may disturb the recovery process and result in poor quality of life. Therefore, it is important for nurses to identify these problems well in advance to begin the nursing interventions in appropriate time.

There is a need for a nurse coordinated comprehensive intervention programme that includes more than one component and closely work together with patients to provide a more efficient and effective care. As preoperative education comprises all the aspects of
patient care, to deliver the various information may include a wide range of professionals involving not only surgeons, but also nurses and other health care team members in order to prepare the patients for the surgery for the better outcomes. Nurses working in specialist roles need to contribute positively towards the comprehensive nursing care including the components such as preoperative education, massage therapy and self-care booklet for the patients following major heart surgery.

**Nursing Education**

Growing research evidences are very important to plan a comprehensive nursing intervention for the patients undergoing CABG surgery to ease their recovery. As an educator the nurse has to be motivated in the development of teaching modules considering the patient’s needs and plan for holistic nursing approach in taking care of the patients. The nursing curricula should emphasize on educating the students on the complimentary therapies such as massage therapy and patient education and allotment of syllabus hours exclusively for teaching complementary and alternative therapies in caring the patients under major heart surgery will be useful.

There is a need for education and training for nurses in comprehensive nursing interventions including complementary therapies to enhance their clinical skills to enable them to practice the same in the clinical area to improve the quality of nursing care. Students can also be actively involved in the patient education while preparing them for the CABG surgery. Nursing students also should be motivated and given enough opportunities to develop creative educational videos including all the essential information about the surgery. The nursing faculty should plan practical hours by means of students
projects in development of educational module for the patients and hands on experience on massage interventions from trained professionals. Add on courses also can be conducted for the students on this areas along with their regular nursing curriculum for their complete and all around development.

Nursing Administration

Improving comprehensive nursing interventional approach in future may be attainable through changes in the nurse’s knowledge, skills, values and attitude. It requires time and commitment, as well as support from the individuals, organizational and professional levels. The use of preoperative video education like the one assessed in this trial can spare nursing professionals to allow more opportunities to answer the patient’s concerns. It can guarantee that all the patients receive standardized and comprehensive information. Trained nursing professionals can conduct regular in-service training on preoperative education for patients undergoing cardiac surgery and for the nurses working in intensive care units to maintain high standard of comprehensive nursing care.

Nursing administrators and leaders should conduct in-service educational programs such as workshop, continuing nursing education, conference, short term courses having collaboration with other health care professionals to provide comprehensive, effective, efficient and cost effective nursing care. Constant and periodic support from the organization and education programmes for nurses can improve their competence and awareness about the importance of comprehensive approach in nursing and health care decisions. Administrators of health and nursing services should be aware of incorporating comprehensive approach of interventions for the improving better health outcomes of
patients and encourage the nurse and other health team members to adhere it in their clinical practice.

Nursing Research

Nursing research provides confident answers to important health questions, which can reform guidelines for the clinical practice, enabling evidence based and quality nursing care. Nurses should be fortified to evaluate the effect of different comprehensive intervention strategies for improving various health outcomes among the patients undergoing CABG surgery. Dissemination of research findings is essential for the implementation of research evidence in nursing practice that yield significant health benefits in the patients.

Extensive nursing research in exploring the effect of nurse led cardiac rehabilitation programme is needed, so that mortality and morbidity can be reduced among patients undergoing CABG surgery. Nurses need to engage in multidisciplinary research so that it will help to improve the knowledge and by applying it, health of the patients can be promoted. The findings of research can be disseminated by means of conference presentation, seminar, workshop and journal publication so that the research evidences can be applied in various health centres and across different patient’s population and health settings.
STRENGTHS

This trial has several strengths.

- To our knowledge this is a first and unique randomized controlled trial in the country to determine the effectiveness of multicomponent interventions (preoperative education, massage therapy and self-care booklet) among the patients underwent CABG surgery comprehensively.

- The sample size of 130 is higher than previous trials of preoperative educational intervention that have been conducted in Iran (Hosein et al., 2013), in the United Kingdom (McHugh et al., 2001) and in Norway (Sorlie et al., 2007). These trial findings have higher weightage comparing to the other studies conducted that were non-randomized controlled trials (Cebeci & Celik, 2011; Towell & Nel, 2011).

- Sample recruitment to this trial was greatly successful with only five patients not willing to participate. The present trial had a low attrition rate of 11% (15/130). The main reasons lost to follow up was due to death, and transfer of follow up to another hospitals nearby the patient’s homes.

- Another important strength of this trial was randomization. Block randomization was done to allocate the samples in to the experimental and control group. It helped in maintaining the balance in recruitment of study participants in each group and prevented the risk of judging the group allocation in advance.

- This trial is a unique one in the country since there was no published data showing similar comprehensive nursing interventional approach on anxiety, fatigue, self-efficacy, and quality of life among patients who underwent CABG surgery.
In this trial appropriate statistical methods were used to test the hypotheses and report the study findings and had most robust analysis of intention to treat analysis for the lost to follow up data.

LIMITATIONS

There were also some limitations in this trial.

- The study was conducted in only one setting. One must consider while generalizing this trial findings as data collected from the single setting.
- Blinding was not possible due to the nature of intervention, however the researcher made sure that interventions were not provided in front of the patients who were in the control group.
- Preoperative educational video was shown to the patients in the experimental group in the calm and separate room near the nurse’s station and the patients were covered with the screen while foot massage was administered. Even though the participants were blinded of the intervention the researcher was aware of the group assignment.
- The outcome assessors were not blinded due to lack of research fund. The data were collected by the researcher in person from all the research participants. Most of the data collection tools were self-reported questionnaires, however the researcher did not interfere or influence the participants in responding to the questions.
- The outcome of biomarkers would have added more significance to the research findings, but was not carried out due to lack of funding, however the researcher made all the efforts to check the feasibility of assessing the blood endorphin level.
as one of the biomarkers in the initial stage of the trial, it was dropped in the later stage due to lack of grants and time constrain.

- The researcher also tried for various funding opportunities to both national and international professional bodies and funders but couldn’t receive any.

**RECOMMENDATIONS**

- A multi-centre trial may be conducted applying the same interventions to generalize these findings in various populations.
- The study can be replicated with larger sample size with blinding to check the effectiveness of these interventions.
- The future trials may be carried out with adequate research grant with estimates of biomarkers to prove the scientific connections between the interventions and outcome variables.
- A comparative study or trial can be conducted to determine the individual effects of preoperative education and massage therapy.
- Very few published data are available on nursing led or nurse imitated cardiac rehabilitation for patients undergoing cardiac surgery. Hence, more number of research studies are required and their findings should be published to create health and nursing care guidelines or policies.

**Summary**

This chapter dealt with a brief summary of research study, major findings, discussions, conclusion, implications, strengths, limitations and recommendations.