CHAPTER III

METHODOLOGY

Design
Sample
TOOLS
Stress management Programme
Procedure
Analysis of the Data
METHODOLOGY

The purpose of the study was to test the efficacy of a Stress management programme in reducing stress and anxiety of cardiac surgical patients. This chapter deals with research design, sample, tools and procedures in detail.

Design of the Study

Pre test - post test, control group design was used for the study.

In the pre test - post test control group design, subjects randomly assigned to either the control group or the experimental group. Each group is observed by pre test. One group received a stress management programme, while the other did not. The researcher then tested the two groups again by post test to determine the effect of the programme.

Sample

The sample consisted of 100 patients undergoing Cardiac surgery selected from Medical College Hospitals of Thiruvananthapuram and Kottayam. The age of the sample ranged between 18 and 60 years. Male and female patients who were to undergo open heart or closed heart surgery were selected.
Criteria were set for the selection of samples to ensure homogeneity and to exclude intervening variables.

**Criteria for the Section of Sample**

Patients having history of any debilitating diseases such as hypertension, diabetes mellitus, tuberculosis, kidney diseases, respiratory diseases, or liver diseases were excluded from the sample since these conditions affect the post-operative recovery.

The details of the sample are given in tables 4.1 to 4.5.

**Table 4.1: Age-wise distribution of the sample**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Age Group</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Total</th>
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<tbody>
<tr>
<td>1</td>
<td>18-30 years</td>
<td>31</td>
<td>31</td>
<td>62</td>
</tr>
<tr>
<td>2</td>
<td>31-45 years</td>
<td>14</td>
<td>17</td>
<td>31</td>
</tr>
<tr>
<td>3</td>
<td>46-60 years</td>
<td>5</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
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<td></td>
<td>50</td>
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**Table 4.2: Sex-wise classification of the sample**

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Sex</th>
<th>Experimental group</th>
<th>Control group</th>
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<tbody>
<tr>
<td>1</td>
<td>Male</td>
<td>10</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>2</td>
<td>Female</td>
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<td></td>
<td>50</td>
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</table>
**Table 4.3:** Distribution of the sample based on educational qualifications

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Education</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upto S.S.L.C</td>
<td>22</td>
<td>27</td>
<td>49</td>
</tr>
<tr>
<td>2</td>
<td>P.D.C and above</td>
<td>28</td>
<td>23</td>
<td>51</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>

**Table 4.4:** Distribution of the sample based on monthly income

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Income per month</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Upto Rs 500</td>
<td>9</td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td>2</td>
<td>Rs. 501-1000</td>
<td>36</td>
<td>34</td>
<td>70</td>
</tr>
<tr>
<td>3</td>
<td>Rs. 1001-1500</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Above Rs. 1501</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
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<td>100</td>
</tr>
</tbody>
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**Table 4.5:** Distribution of sample based on type of surgery

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Type of operation</th>
<th>Experimental group</th>
<th>Control group</th>
<th>Total</th>
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<tr>
<td>1</td>
<td>Closed mitral volvotomy</td>
<td>14</td>
<td>26</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>Repair of PDA</td>
<td>3</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>Value replacement</td>
<td>14</td>
<td>5</td>
<td>19</td>
</tr>
<tr>
<td>4</td>
<td>Repair of ASD</td>
<td>19</td>
<td>14</td>
<td>33</td>
</tr>
<tr>
<td>5</td>
<td>Pericardial cystectomy</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>50</td>
<td>50</td>
<td>100</td>
</tr>
</tbody>
</table>
Tools

The investigator used the following tools to collect data.

1. **Stress Check list (SCL)** - Constructed by the Investigator (1996)


3. **Post-operative complication check list (POCCL)**. Developed by the investigator (1996)

4. **Stress management programme (SMP)**, Developed by the investigator (1996).

1. **Stress Check List (SCL)**

   The investigator herself designed the Stress Check List based on review of literature and consultation with experts. Extensive review of literature contributed fifty items describing signs and symptoms of stress on human body. These items included physical and psychological symptoms of stress and strain. These fifty items were listed from one to fifty in a table and a separate answer sheet was designed in which the client could mark his response as ‘Yes’ or ‘No’.

   **Scoring:-**

   A score of one was given to each ‘Yes’ response. When a person got a score of 10 or more he was considered to be under
stress. General instructions for giving the response by putting (√) mark in appropriate columns were included in the check list.

A model of the stress check list and answer sheet is given as Appendix I and II.

2. **State-Trait Anxiety Inventory (STAI)**

State-Trait Anxiety Inventory developed by Spielberger, Gorsuch and Lushene (1968) was adapted into Malayalam by Das and Kumar (1994). This was used to collect state and trait anxiety of the selected patients before and after cardiac surgery. The inventory comprised separate self report scales for measuring two distinct anxiety concepts—state anxiety and trait anxiety. The STAI-state anxiety consists of eighteen statements that ask people to describe how they feel at a particular moment. The STAI-Trait anxiety scale also consists of eighteen statements. These statements require the subject to indicate how they generally feel. These two scales are printed on opposite sides of a single form.

**Reliability**

**Split-half Reliability**

The split-half reliability of the inventory was found to be 0.89 for state anxiety and 0.79 for Trait anxiety. The test-retest reliability obtained was 0.81 for state anxiety and 0.70 for trait anxiety.
Validity

The correlation coefficient obtained for state inventory was 0.84 and that for trait inventory was 0.86. These validated against the ratings made by the progress scores show that the test has high validity.

The test can also claim face validity, since the final scale of the inventory was prepared after item analysis.

A model of the STAI is given as appendix III and answer sheet as appendix IV.

Scoring

The range of possible scores of STAI varies from minimum score of twenty to a maximum score of eighty in both state and Trait subscales. Clients respond to each STAI items by rating themselves on a four-point scale as described below.

<table>
<thead>
<tr>
<th>State anxiety</th>
<th>Trait Anxiety</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not at all</td>
<td>1. Almost never,</td>
</tr>
<tr>
<td>2. Some what</td>
<td>2. Sometimes</td>
</tr>
<tr>
<td>3. Moderately so, and</td>
<td>3. Often,</td>
</tr>
<tr>
<td>4. Very much so</td>
<td>4. Almost always</td>
</tr>
</tbody>
</table>
3. **Post-Operative Complication Check List (POCCL)**

The post-operative complication check list was designed to measure the post-operative complications of the cardiac surgical patients.

The post-operative complication check list was designed on the basis of the experience of the investigator, consultation with experts in the field of cardiac surgery and review of literature. The investigator designed the post-operative complication check list for cardiac patients undergoing open heart and closed heart surgery.

Post-operative complications check list consisted of 2 sections, Section A and Section B. Section A involves identification of data of the patients, vital signs of patients—temperature, pulse rate, respiratory rate, blood pressure, fluid intake and urine output. Vital signs were measured to assess general condition of the patient. Separate space was included to mark the date of admission, date of surgery and date of discharge.

Section B consisted of 34 items of post-operative complications and separate columns were provided to mark their response as Yes or No in the same questionnaire.
Administration and Scoring:

The post-operative complication check list was filled up by the investigator based on the information obtained from her observations and physical assessment and measurements of vital signs and chart review.

In the POCCL, 34 post-operative complications were numbered from 1 to 34. Minor complications which may not cost the life of the patients and could be reverted by medical intervention, were listed as item number 1 to 18. A score of 1 was given to these items. The items from 19 to 34, which are serious complications leading to death of the patients or chronic disabilities and handicaps, were given a score of 2 each.

The maximum score was fifty. A score of zero indicated an uneventful recovery with no complications. A score of one to two was considered as mild complication. A score of 3 and above was considered as serious complication.

A model of the post-operative complication check list is given as appendix V.

4. The Stress Management Programme

The stress management programme for the present study was prepared by the investigator for the patients undergoing
cardiac surgery. The package programme is a comprehensive, practical intervention for managing stress and anxiety before surgery so that subsequent post-operative complications could be prevented. It involves three techniques—Deep breathing exercises, Relaxation techniques and Information about pre-operative preparations and post-operative management of cardiac surgery. This package takes care of the physical, psychological and cognitive aspects of the illness stress and anxiety of the patient, resulting in an uneventful, smooth recovery following cardiac surgery. This will help to relax the mind and body simultaneously, increase oxygen intake and thereby increase physical vitality of patients. Information about pre-operative preparations and post-operative management clears all doubts about the stressful situation, enabling the patients to prepare well ahead to deal with the pre-operative anxiety and stress which could have impeded their post-operative recovery. A detailed description of each of the techniques is given below.

1. **Breathing Exercises (BE)**

Breathing exercises enable the cardiac patient to absorb more oxygen from the air they breathe in and thereby increase their oxygenation and feeling of well-being. It will refresh their body and help them to maintain their lungs free of secretion post-operatively. It helps the patient to feel more relaxed and refreshed.
Though there are various methods of breathing exercises two simple and effective breathing exercises are Diaphragmatic breathing exercises and Pursed lip Breathing Exercises.

**Diaphragmatic Breathing Exercises (DBE)**

This is also termed as abdominal breathing. In abdominal breathing, the abdomen visibly rises during deep inhalation and contracts during exhalation. With expiration the patient should feel the abdomen muscles tightened. Tightening the abdominal muscles helps the diaphragm to squeeze air out of the lungs. By placing one hand on the abdomen and the other on the chest, the patient can feel whether he is breathing correctly while sitting up or reclining.

Diaphragm is the most important respiratory muscle, the paralysis of which will lead to respiratory failure. Diaphragmatic breathing exercises are practised to strengthen this vital muscle so that the patient could be trained to breath slowly and deeply without any distress and pain during their post-operative period. Since cardiac surgery involves the chest wall, breathing will be painful and distressing soon after surgery, for all the patients. Patients often suffer from increased bronchial secretions as a result of shallow breathing. This in turn may lead to respiratory complications such as aspiration pneumonia, respiratory failure,
lung congestion etc. By doing deep breathing exercises such as diaphragmatic breathing exercises secretion from lungs could be brought out easily, thereby preventing respiratory complication and hastening postoperative recovery.

A detailed description of the steps followed in Diaphragmatic Breathing Exercises is given below:

1) The patient is placed in a comfortable and relaxed semi fowler's position.

2) The right hand of the patient is placed on his chest around the lower ribs with fingers comfortably spread.

3) The left hand on the abdomen and instruct the patient to sit straight so that the lungs would remain in its natural normal position.

4) The patient is asked to inhale through the nostrils slowly (while relaxing the abdomen) and press his chest wall inwardly with his right hand. By doing so the diaphragm is being used for breathing.

5) The patient is instructed to pause naturally and briefly at the end of each inspiration. This effects a smooth pattern of ventilation and an even distribution of air into and out of the lungs.
6) During exhalation, the patient is instructed to press the left hand on the abdomen inward and upward, while he contracts his abdominal muscles. The patient is instructed to purse the lips during exhalation.

**NB:**

- Ideally, the length of exhalation should be two or three times longer than the time of inhalation.
- Do not excessively emphasise the amount of exhalation time. If undue effort is placed on counting, the patient generally becomes anxious and this may lead to dyspnoea.
- After the patient has mastered this technique, instruct him/her to practice it regularly for 50-60 items twice daily during the pre-operative and post-operative periods.
- Gradually the patient learns to adjust to this controlled breathing pattern, during pre-operative and post-operative periods.

**Pursed Lip Breathing (PLB):**

Pursed lip breathing is another simple, effective and practical breathing exercise that can be used by cardiac patients, before and after surgery. It helps to control one’s breathing by pursing the lips. It increases resistance during exhalation, which
in turn force all the alveoli (lung unit) to expand and contract effectively to the maximum. This method is very simple and useful to the cardiac patients and is being widely used among the patients undergoing cardiothoracic surgeries.

Pursed lip breathing allows the lung unit to expand completely so that oxygen uptake and carbon dioxide excretion can be improved. Secretions that develop inside the lungs after surgery could be easily brought out of the lungs by pursed lip breathing after steam inhalation. This improves oxygenation and refreshes the patient and increases his feeling of well being and prevents post-operative lung complications.

**Steps Followed in Pursed Breathing:**

1) The patient is encouraged the patient to sit comfortably with spine straight.

2) The patient is instructed to breath in slowly through the nose.

3) Then patient is instructed to exhale slowly through pursed lip, so that a ‘blowing’ effect occurs during exhalation. Instruct the patient to “blow out as if you were slowly blowing on the flame of a burning candle without putting off the..."
flame". The investigator herself demonstrated the procedure along with instruction.

4) The patient is encouraged to breath out through a pursed lip slowly and completely for a comfortable length of time.

Both these breathing exercises were practiced at the rate or 50-60 times, twice daily pre-operatively and four hourly after the surgery. This was also practiced just before and after guided somatopsychic relaxation.

2. **Guided Somato Psychic Relaxation (GSPR)**

Guided Somato Psychic Relaxation (GSPR), developed by Sreedhar (1996), is popular for its simplicity, and its unambiguous, and definite and smooth steps. It is famous for its effectiveness in giving mental relaxation along with physical relaxation. In GSPR the relaxation is a totally guided one, starting from the soma to the psyche. GSPR is found to be very practical and simple for cardiac surgical patients to practice, since it does not involve any strenuous, sudden movement of body parts. The movements are slow and steady and systematic in GSPR.

The purpose of GSPR is to reduce the stress and anxiety of the cardiac surgical patients before and after undergoing cardiac surgery.
Matteson and Invancevich (1987) have reported that successful relaxation results in enhanced feelings of well-being, peacefulness, a sense of control and a reduction in felt tension and anxiety. Physiologically it decreases blood pressure, respiration and heart rate.

GSPR is a modified form of Jacobson’s Progressive Muscular Relaxation (JPMR). In JPMR mental relaxation is not given much importance though it is very effective in giving physical relaxation. But in GSPR much attention is paid to mental relaxation.

**Technique of GSPR**

Guided Somato Psychic Relaxation technique was developed by Sreedhar (1996), Professor and Head of the Department of Psychology, University of Kerala, Trivandrum. The investigator has obtained permission form Prof. Sreedhar for using the technique for this research. The investigator has undergone training from Prof. Sreedhar in the mode of administration of this technique.

**Steps Followed in GSPR**

a) The patient is instructed to lie down on a comfortable cot in a supine position with head slightly raised on a pillow.
b) The patient is informed that the relaxation has both physical and mental stages. In the physical stage there are ten steps. In the mental stage there is a visualization process.

c) All doubts of the patients were clarified before starting GSPR.

d) The investigator demonstrated and described the following ten steps for physical relaxation.

**Physical Relaxation-Steps Used**

The patient is instructed to close his/her eyes from the beginning till the end of GSPR and listen only to the directions given and to avoid other distractions.

**Step I**- Bring both the feet parallel to each other and bend the feet towards the body at the ankles. Feel the tension, feel the relaxation by bringing the feet to normal position when directed to RELAX..........

**Step II**- Bring the feet parallel to each other, and push the toes away from the body as if pointing towards the wall. Feel the tension, feel the relaxation by bringing the feet to normal position when directed to relax.

**Step III**- Bring the feet parallel to each other, push the heels vertically downwards, without bending the knees, feel
the tension, relax by putting the legs into normal position when directed to relax.

Relax the body parts from hip to toes when directed to do so.

Step IV- Clench both the fists as if trying to squeeze water out of a sponge. Feel the tension. Relax by putting hands to normal position by opening the fists slowly when directed to relax.

Step V- Clench both the fists again and bend the elbows and let the fists try to touch the shoulders and press down on the shoulders. Feel the tension. Relax by putting hands back to normal position after opening the fist when directed to relax.

Step VI- Arch both the shoulders backwards by raising the chest and breathing normally, feel the tension, relax and assume normal position when directed to do so.

Step VII- Arch both the shoulders to the front, feel the tension. Relax by assuming the normal lying position when directed to do so.

Relax body parts from shoulders to tip of fingers as directed.
Step VIII- Bring the chin a little down and push back the head downwards, feel the tension, relax, by assuming normal natural position when directed to relax.

Step IX- Raise the eye brows and form wrinkles on the forehead without opening the eyes. Feel the tension, relax by assuming normal position when directed to relax.

Step X- Close the eyes tightly, feel the tension of eye lids. Relax by removing tension from eye lids slowly when directed to do so.

Relax the body parts from head to toes when directed to do so

**Relaxation of Mind**

For relaxation of mind the patient is instructed to visualize as detailed below.

1. Visualize a beautiful pond, filled with crystal clear water in a very calm and peaceful environment during the dusk. The water in the pond is clean, pure, serene, tranquil and absolutely standstill.

2. Like the water in the pond now the mind is also becoming clearer and clearer.

3. Now the mind is extremely pure, serene, tranquil, transparent and absolutely standstill.
4. Let your awareness get into deeper and deeper layers of your mind. Deep down the mind there exists a total silence. Be in that silence until I call you. RELAX (for 2 mts)

5. The mind and body are now completely relaxed.

**Instructions for Coming out of Relaxation**

The patient is instructed to come out of the relaxation by counting 1-5 and by making him gradually open his eyes.

1. Open your eyes gradually and slowly when you hear counting from one to five.

2. Place your hands on the stomach with fingers held together.

3. Bring the toes together and release them.

4. Turn your head to the left side and then to the right side.

   Free the hands and slowly sit up as usual

   The heart rate of the patients was monitored before and after the relaxation to assess whether the patient had relaxed well. It was found that the heart rate was considerably reduced by guided somato-psychic relaxation.

   The investigator used an audio cassette for giving GSPR to the selected cardiac patients.
Information Module

Along with mental and physical relaxation obtained from undergoing GSPR and BE, one could be enabled to handle knowledge deficit regarding cardiac surgery, which is another important stressor to cardiac surgical patients. As evidenced by several research studies stress and anxiety could be reduced to a minimum by providing adequate information about a procedure or event as surgery. (John 1989) Awareness about a stressful event helps the individual to cope positively with the physical, psychological and emotional problems. It is observed that post-operative complications could be prevented by adequate preoperative preparations. Usually the patients would co-operate better if they are provided with the why and what of the pre-operative procedures. Hence clear, unambiguous, and correct instructions are needed for better co-operation from patients and relatives. This would no doubt help to reduce stress and anxiety among the patients, thus bringing down post-operative complications.

The module consisted of section A, B and C.

Section A: Information regarding pre-operative procedures.

Section B: Instruction while transferring patients to the operation theatre.

Section C: Information regarding Post-operative management.
The following details of the information module were taught to the patients, individually.

Section A: Information Regarding Pre-operative Preparation

Today, cardiac surgery has developed to an extent that doctors are able to repair even the defects inside the heart without much complications. Modern surgical procedures enable the patients to lead a productive life without distressing signs and symptoms such as dyspnoea, palpitation etc even after the surgery.

Defects in the heart such as a hole in the septal wall separating the chambers of heart, defects of heart valves and blood vessels can be repaired. Defective valves can be replaced by prosthetic valves too, to save a life. The death rate among cardiac patients has been reduced to minimum as a result of scientific advancement in the field of cardiac surgery. Yet there are chances of developing some complications after cardiac surgery which can be prevented by proper pre-operative preparations.

Appropriate and timely pre operative preparations would enable the patient to have a smooth, calm, and uneventful recovery from cardiac ailments after cardiac surgery. This also helps in the prevention of post-operative complication. The patient’s willingness and Co-operation are highly essential for the pre-operative preparations.
So patient’s pre operative preparation can be successfully done only with his willingness and co-operation. The pre-operative preparations consist of the following aspects of care.

A. Physical preparations
B. Physiological preparations
C. Psychological preparations
D. Legal preparations

A. Physical Preparations

This includes assessment of the soma and making sure that the person is fit for surgery. Physical preparation includes the following.

1. The following investigations have to be done to assess the general condition of the body and to detect the specific defects.

   a) Laboratory investigations of blood, sputum, Urine and Stool.

   b) Radiological and other investigations like X-ray, Echocardiogram, Angiogram, ECG, MRI, and Stress Test.

   If any disease other than cardiac ailments is detected from the result of these tests, it is treated and the homeostasis of the body is regained before cardiac surgery.
2. The temperature of body, rate of pulse and respiration, Blood pressure and weight of the patient will be monitored as a routine, everyday.

3. Any other defects such as disease of the ear, diabetes mellitus, hypertension, dental caries or any other source of infection inside the body will be treated prior to surgery so that these abnormalities may not interfere with surgery and its recovery. For this purpose the patient need to consult doctors from other departments on reference to ensure that he is free from any debilitating diseases other than cardiac diseases.

4. Specific articles required for surgery, such as prosthetic valves, disposable parts of cardiopulmonary bypass machine etc., should be arranged as listed by the doctors.

5. Arrange adequate number of blood donors before surgery.

6. Consult doctors of Anesthesia department and get certified that the patient is fit for surgery.

7. Local preparation-The chest wall axilla and neck will be shaved upto umbilical level. Shampoo the hair and have a thorough bath after shaving on the evening of the day before surgery.
8. Change personal dress to white shirt and dothi prior to surgery.

9. Braid the hair into two (if it is long), fold and tie it at the sides and cover the head with a cap provided from the hospital.

10. Remove all metallic items from the body such as ornaments, watches etc., and entrust them to relatives.

11. Remove prosthetic dentures, spectacles, and hearing aids from the body and keep them safe with relatives.

12. Remove nail polish if any and cut short the nails.

B. Physiological Preparations

The physiological state of the human body is in equilibrium in a healthy body. Cardiac patients need physiological preparation to have an optimum level of physiological functioning to undergo all the physiological and hemodynamic changes during and after surgery. Physiological preparation of a cardiac surgical patient is detailed below.

1. Any changes in vital signs—pulse rate, respiration rate, blood pressure, temperature or an imbalance of fluid intake and output—will be treated and corrected before surgery.
2. The patients need to fast from 10 p.m. onwards, on the night before surgery. Even drinking sips of water should be avoided. This is to prevent complications during and after anesthesia.

3. On the night before surgery the patient need to take sedatives for a comfortable sleep. (Usually it is given at 10 p.m.).

4. Physical assessment will be done by doctors and nurses to ensure fitness for surgery early in the morning on the day of surgery.

5. Just before taking to the operating room, pre-medication injections are given to minimise stress and anxiety. Sometimes the patients feel drowsy and sleepy after these injections and hence getting up and walking after these pre-medications should be avoided.

6. Patients are taken to the operating room in a trolley along with all investigation reports and medical records.

C. Psychological Preparations

Since mind and body are inter related, cardiac surgical patients need adequate psychological preparation to minimise stress and anxiety and further complications. A cardiac surgical patient may be prepared psychologically as follows.
1. Give freedom of expression to patient and clear all his doubts to minimise stress and anxiety.

2. Give training in guided somato psychic relaxation along with deep breathing exercises as mentioned earlier so that patients could relax well.

3. Reassure about the positive outcomes after cardiac surgery, showing another cardiac surgical patient who is recovering without complications.

4. Promote religious practices such as prayer meetings to relieve stress and anxiety.

5. Inform that they will never perceive any pain or discomfort during surgery since they are given anesthetic drugs, prior to surgery.

6. Ensure that they will be given pain killers if they feel the pain soon after surgery, upon request.

7. Encourage social support from the other family members.

8. Let the patient ventilate all his fears and anxiety in a counselling session if required.

9. Make arrangements for the patient to meet a patient who is recovering from similar surgery without any complications.
D. Legal Preparation

Ethical and legal principles need to be followed while dealing with human beings and their health problems. The legal preparation of a patient undergoing cardiac surgery involves the following steps.

1. Patients and relatives are given adequate information about the outcome of the surgery and its complications.

2. The patient and the relatives need to sign a written consent agreeing to undergo cardiac surgery, knowing all its consequences.

Section B: Instructions while Transferring Patients to Operating Room

Patients will be shifted to the operating room in a trolley along with all his investigation reports and records. The following instructions could be useful during the shifting period.

⇒ Pray to God Almighty. Be calm and self confident.
⇒ Do breathing exercises calmly and quietly.
⇒ Try to visualise a calm and peaceful environment.
⇒ Believe that your life will be safe in the hands of God.
⇒ Be courageous to face any difficulties.
⇒ Remember that these problems and sufferings will be reduced gradually day by day.

⇒ Be optimistic about the outcome of the surgery.

⇒ Believe that God is taking care of you safely through the hands of the doctors and nurses, through out the surgical procedure.

⇒ Think about a productive life after surgery, which is free of all the distressing symptoms such as chest pain, dyspnoea and palpitation etc.

⇒ Try to relax the body, part by part, gradually as demonstrated while doing GSPR.

⇒ Remember that any emergency could be managed scientifically and effectively in the hospital with the help of advanced technology.

⇒ Wait patiently in the operative room along with other surgical patients, until your turn for getting operated comes.

Section C: - Post-operative Management

The cardiac surgical patient requires individualised, comprehensive and expert nursing care soon after cardiac surgery to prevent all possible complications following surgery. For that
purpose the patient need to be treated inside a modern, well equipped cardiac intensive care unit for two to three days after surgery.

The following instructions regarding post-operative management were given to the selected patients.

➢ The patients need to be treated inside intensive care units for 2-3 days after surgery.

➢ Relatives are not permitted to be with the patient inside the Cardiac Surgical ICU.

➢ Patients will be constantly monitored inside the ICU using modern equipments, such as ECG machine.

➢ Ventilators may be used for patients to assist breathing if there is any breathing difficulty.

➢ There will be some tubes attached to the patient’s body, such as intercostal drainage tube in the chest wall, urinary catheters, nasogastric tubes, intravenous infusion sets and its canulas etc. All these tubes will removed from the body as the general condition of the patient improves.

➢ Patients may find breathing painful and difficult due to incision in the chest wall and intercostal drainage tubes. Slow
and deep breathing exercise, supporting the site of incision with the hand, could be practised as taught earlier.

- Intravenous infusion of glucose will be given continuously for 24 hours during the immediate post-operative days and gradually it will be stopped to start oral fluids.

- The patient may experience severe pain in the operated area, which could be relieved by pain killer medications and relaxation of chest wall as taught along with GSPR.

- In order to hasten wound healing and prevent infection, many injections will be given such as antibiotics and anti-inflammatory drugs.

- The pain, sufferings, and other discomfort will decrease gradually as the days pass on.

- Practise breathing exercises as taught earlier every four hours at the rate of 50-60 times. This helps to prevent respiratory complications.

- Practise GSPR as and when you experience pain and agony to relieve pain and relax the body. The wound healing will be much faster if the muscles are relaxed.
 Patients need to take steam inhalation or medicated inhalation every 4 hours. Breathing exercise after inhalation helps to bring out all the secretions from the lungs and ease breathing.

 Patients need to obey all the instructions given by doctors and nurses in ICU and co-operate well with them to have a smooth and uneventful recovery.

 Food and fluid will be restricted for the first 24 hours soon after surgery and later it will be given gradually as instructed by the caregivers.

 Patients will be shifted from ICU to ward after two to three days.

 Usually stitches at the operation site will be removed on the 8th day after surgery if there is no wound complication.

 Patients will be discharged to home soon after removing stitches from the operation site.

 Patients need to clear all their doubts regarding follow up visits, food and fluid restrictions, medications, rest and activity, and others, if any, prior to discharge.

 Usually, patients need a follow up visit at cardiac surgery department one month after discharge. If any other problems
develop after going home, report to the nearest doctor immediately.

**Post-Operative Complications**

Though science and technology have advanced to such an extent to minimise the morbidity and mortality rate of cardiac surgical patients, occasionally there are chances of the following post-operative complications. The meaning of each post-operative complication listed in the post-operative complication check list developed by the investigator, is detailed below.

1. Hypotension: A condition in which the blood pressure of the patient is below 90/60mm of Hg, detected by checking blood pressure using BP apparatus.

2. Arrhythmias: A condition in which there is variation from the normal rhythm of the heart beat, detected by the auscultation of the chest, using a stethoscope.

3. Myocardial infarction: A condition in which there is death of cells of the heart due to
5. Mediostinal bleeding:

lack of blood supply to that area due to coronary artery diseases.

4. Hypertension:

A condition in which there is high blood pressure above 130/90 mm of Hg., detected by measuring blood pressure with a BP Apparatus.

5. Mediostinal bleeding:

Bleeding from the middle part of the chest where the operation is done.

6. Coagulopathy:

A disorder of blood clotting, named as clotting disorder.

7. Wound complications:

Any complication of the wound such as infection, dehiscence, gaping of wound or keloid formation.

8. Sepsis:

Presence of tissues, pathogenic micro organism or their toxins in blood, following surgery.
9. Pneumonias: A disease condition in which there is inflammation of lungs with exudation and consolidation.

10. Pulmonary complications: Any diseases of the lungs or its complications, associated with cardiac surgery such as injury to lung tissues, respiratory failure, respiratory arrest etc.

11. Fever: A condition in which there is elevation of body temperature above normal (37°C).

12. Stroke: A condition due to acute vascular lesions of the brain (haemorrhage, embolism, thrombosis, rupture of aneurysm), which may be marked by hemiplegia, hemiparesis, vertigo, numbness, aphasia, dysarthria, and often followed by permanent neurological damage.

13. Renal failure: Inability of the kidney to excrete metabolic waste products from blood, marked by uremia, oliguria, hyperkalemia and pulmonary oedema.
14. Fluid and electrolyte imbalance:
   A condition in which there is an imbalance between fluid intake and urine output.

15. Hepatitis:
   Inflammation of the liver, characterized by jaundice, purists, dark urine and pale stools.

16. Haemolysis:
   This condition is characterized by separation and liberation of hemoglobin from red blood cells and it appears in plasma.

17. Transfusion reaction:
   Allergic reaction manifested by patients after introduction of whole blood or blood components such as plasma or packed cells, directly into blood stream through blood transfusion.

18. Vascular problems:
   A condition associated with leak of blood supply due to spasm, thrombosis or embolism of blood vessels any where in the body.
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<th>Description</th>
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<tr>
<td>19.</td>
<td><strong>Nerve trauma:</strong> A condition associated with injury to nerve, in and around operation site, due to surgical manipulation or application of tourniquet.</td>
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<td>20.</td>
<td><strong>Post-operative psychosis:</strong> A condition in which patients exhibit signs and symptoms of psychosis—a mental illness—after cardiac surgery.</td>
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<tr>
<td>21.</td>
<td><strong>Post-operative depression:</strong> A condition in which patients develop psychotic depression after cardiac surgery.</td>
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<td>22.</td>
<td><strong>Paravascular leak:</strong> A condition in which there is leak in valves after reparative surgery or replacement surgery.</td>
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<tr>
<td>23.</td>
<td><strong>Embolic occlusion:</strong> A condition characterized by a blockage of blood vessels due to embolism anywhere in the body.</td>
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| 24. | **Endocarditis:** A condition in which there is exudative and proliferative inflammatory alterations of the
endocardium. It is characterised by the presence of vegetation on the surface of endocardium involving the valves and inner lining of the cardiac chambers.

25. Prosthetic valve malfunction: A condition in which the new artificial valve, placed inside the patient’s heart, replacing the defective valve, does not function effectively.

26. Haemolytic anaemia: A condition in which there is reduction of number of erythrocytes, quantity of haemoglobin or volume of packed cells in blood, due to shortened survival of mature erythrocytes and inability of the bone marrow to compensate for their decreased life span.

27. Ventricular rupture: A condition in which the ventricle of the heart breaks or gapes after surgery.
28. Cardiac arrest: A condition characterized by sudden stoppage of heart.

29. Post-operative haemorrhage: Bleeding from the external or internal wounds after surgery.

30. Drug sensitivity: Allergic reactions following administration of any drugs.

31. Rapid and thready Pulse: A condition characterized by increased rate of heart and pulse with less tension of pulse than normal.

32. Cardiogenic shock: A condition in which there is disparity between blood volume and blood space due to cardiac diseases.

33. Apraxia: A condition characterized by loss of ability to carry out familiar purposeful movements in the absence of motor or sensory impairment. There will be inability to use objects correctly.
34. Pericardiectomy Syndrome: A condition following surgical incision of pericardium characterized by cardiac tamponade and bleeding.

Procedure

The present study was aimed at finding out the efficacy of a newly designed stress management programme in relieving stress and anxiety of cardiac surgical patients. The stress checklist and post-operative complication checklist, and the stress management programme were developed by the investigator, which were not tested on any population before. Moreover, the review of literature failed to provide any systematic scientific data about similar experimental studies conducted in Kerala. Hence the investigator proposed to conduct a pilot study to test the adequacy of stress check list (SCL), stress management programme (SMP) and post-operative complication checklist (POCCL) and also to assess the feasibility of the present study.

Pilot Study

Permission was obtained from the authorities of the Medical College Kottayam and Medical College Trivandrum for conducting the pilot study.
Initially, the investigator visited the selected wards of the hospital in order to establish rapport with the patients and the hospital personnel. Patients for the pilot study were identified through chart review and interview by the investigator. The purpose of the study was explained, voluntary risk-free participation was requested. Confidentiality of their response was ensured. The patients who fulfilled the criteria for selection were selected for the pilot study.

Thirty patients formed the sample for the pilot study. They were randomly divided into two groups of 15 each. One group was treated as the control group and the other, the experimental group.

Both these groups were pre-tested for anxiety using STAI, (Malayalam adaptation) and SCL. The patients filled in the answer sheets and returned the same to the investigator. The investigator checked each answer sheet for errors and omissions. The tools were found adequate since the patients could respond to these tools without any practical difficulty.

The experimental group was given the stress management programme, which included GSPR, breathing exercise and information module.
The control group was not given the SMP. They received only routine pre-operative and post-operative hospital care.

Both these groups were given post-test on the seventh day post-operatively. The STAI was used to measure anxiety and SCL was used to assess the stress post-operatively. The post-operative complication check list was used to measure post-operative complications. These tools were found adequate for measuring post-operative stress, anxiety and post-operative complications.

**The following conclusions were drawn from the pilot study**

1. The Stress Check List, State Trait Anxiety Inventory (Malayalam Adaptation) and Post-Operative Complication Check List were found adequate for the present study.

2. The Stress Management Programme was found adequate, feasible and simple for administration in the present clinical setting for cardiac surgical patients.

3. The study was found to be very useful and well appreciated by the clinical staff and cardiac surgical patients.

4. The appropriate timing for data collection was found to be between 12 noon and 6.30 p.m.
5. The level of stress and anxiety was found to be considerably lower after surgery than before surgery in the patients belonging to experimental group. There were only negligible changes in control group.

Since the adequacy of the tools and the stress management programme was established through the pilot study, the final study was conducted without any changes in the tools and techniques.

Permission was obtained from the authorities of Medical College Kottayam and Medical College Trivandrum for the present study.

**Final Study**

Permission was obtained from the authorities of Medical College Kottayam and Medical College Trivandrum for the present study. The subjects were taken from Medical Colleges of Kottayam and Trivandrum as had been done for the pilot study.

Subjects for the final study were identified through chart review and interview by the investigator.

Hundred patients were selected for the final study as per criteria mentioned earlier. Those patients who were taken as subjects for pilot study were not included in the final sample. The purpose of the study was explained and participation of the
patients was requested. The confidentiality of their responses was assured. The patients were willing for voluntary participation and were very co-operative.

The sample for the final study included 100 cardiac surgical patients, 50 belonging to the experimental group and 50 to the control group.

Both the groups were pre-tested for anxiety and stress by STAI (Malayalam version) and SCL.

The selected patients were given clear instructions regarding self-administered questionnaire and they were asked to read the instructions to ensure comprehension. Assistance was given only upon request to clarify their doubts. Separate answer sheets were used for STAI and SCL. The investigator checked each form carefully for errors and omissions and got it filled completely by the cardiac surgical patients.

After pre-testing, the experimental group was given training in stress management programme and the control group was not given any special treatment. They received only the routine hospital care pre-operatively and post-operatively.

Seven days after the cardiac surgery, the patients of both the groups were given post test for measuring stress using SCL,
and anxiety using STAI. Post-operative complications were assessed by the investigator using post-operative complication check list. The techniques used for Pilot study were followed for final study also.

**Analysis of Data**

The difference in scores obtained in pretest and post test for each patient, in tests measuring stress and anxiety, was calculated separately for both the groups. The significant difference between these two groups in each of the variables was determined by 't' test and paired 't' test.

The following chapter deals with details of analysis and results.