

# Effectiveness of Information Booklet regarding Home Care of Pacemaker among the Patients with Complete Heart Block

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**Abstract:** India, a country with more than one billion people, will account for 60 per cent of heart disease patients worldwide by 2010. Study was aimed to assess the Effectiveness of Information Booklet regarding Home Care of Pacemaker Among the Patients With Complete Heart Block. **Methodology:** One Group pre test post test with evaluatory approach used with 30 samples were selected by convenient sampling technique. **Findings-** Maximum subject 12 (40 %) belonged to age group of 35-44 years. Most of subject that is 19 (63.3%) were female. Majority 11(36.7%) of the subject had studied till secondary School. Largest component of the subject that is 11(36.7) were belongs to business category. Highest subject 19 (63.3 %), belongs to the Rs. 5,001 to Rs.10,000 income /month. In pre test maximum 21(70%) subject had average knowledge .The post test score reveals that maximum subject 26(86.7%) were had good knowledge and 4(13.3%) belong to excellent none of the subject belong to poor and average. The calculated 't' value was found to be 19.55 for knowledge. As the calculated value was greater than the table 't' value 2.04 at 0.05 level of significance with the degrees of freedom 29. The findings of the study shows that, there is no association exists between knowledge score after administration of information booklet with selected demographic variable as, age in years, gender, educational status, occupation, family income. The entire demographic variables are working independently. **Conclusion** - Information Booklet regarding Home Care of Pacemaker was effective among the Patients with Complete Heart Block

**Keywords:** Information Booklet, Pacemaker, Patients, Heart Block

## 1. Introduction

The cardiovascular crisis in India has quadrupled in the last 40 years and WHO estimates that by 2020 close to 60% of cardiac patients worldwide will be Indian. The established risk factors of cardiovascular disease include lack of exercise, poor diet, and smoking. According to the study the Indian subcontinent (including India, Pakistan, Bangladesh, Sri Lanka, and Nepal) has the highest rates of cardiovascular disease (CVD) globally. The emerging field of environmental cardiology addresses exposures to chemicals and other environmental substances also have profound impact on heart health

Technology has helped the health lives of thousands of people around the world. All of these health findings are used to detect the diseases and help patients to cope with health problems. One of the technological health inventions is artificial pacemaker, invented by a Canadian John Hopps in 1950 and it was used for the first time in human body in 1958 after several modifications.

In 1899, J A Mc William in the British Medical Journal reported, that the effect of applying of an electrical impulse to the human heart during a systolic heart beat caused a ventricular contraction and a heart rhythm of 60-70 beats per minute could be evoked by impulses applied at pacing's equal to 60-70/minute[1].<sup>10</sup>

## 2. Need of the Study

Normally, the heart beats in a regular and coordinated way like a clock or metronome. However, many people with heart failure may have a heart that beats irregularly either too fast and/or too slow. These rhythm problems are often referred to as arrhythmias or dysrhythmias. They are often benign, which means these rhythm problems do not cause any deviation and are not related to any known abnormality of the heart. But arrhythmias may also be due to changes in the heart from either heart failure or a previous condition such as a heart attack or long-standing high blood pressure. Under these circumstances arrhythmias may be dangerous and are important to understand and treat. With proper treatment and self-care, people with heart failure can lead normal and active lives even if they have a heart rhythm problem[2].

Cases of cardiovascular disease may increase from 2.9 crore in 2000 to as many as 6.4 crore in 2015 and deaths resulting from CVD will also rise more than double. Prevalence rate of cardiovascular disease in rural population remains lower than that in the urban population; this will continue to increase, reaching around 13.5% of the rural population within the age group of 60-69 years by 2015[3].

India, a country with more than one billion people, will account for 60 per cent of heart disease patients worldwide by 2010. A study among Asian Indian men showed that half of all heart attacks in this population occur under the age of 50 years and 25 percent under the age of 40, according to the Indian organization [4].

### 3. Review of Literature

The review of literature is a summary of current knowledge about a particular practice, problem and includes what is known and what is unknown about the problem. Literature is reviewed to summarize knowledge for use in practice or to provide a basis for conducting a study [5].

#### 3.1 Literature related to self instructional module.

Learning is the addition of new knowledge and experience interpreted in the light of past knowledge and experience. Teaching and learning is an integral part of nursing. Nurses have the responsibility to educate patients related to various aspects and keep themselves updated. Various teaching strategies are used to increase knowledge, such as lecturing, demonstration, discussion and self-education. These methods of self-education has an advantage over the others as the learner can educate himself at his own pace and it also stresses on rereading[6].

Mali R concluded that a specialized training program intended to impart knowledge regarding medico legal responsibilities to the staff Nurses need to be organized and implemented. It will in turn help her in acquiring a better efficiency & vigil in her services[7].

Nurses prefer to use an self instructional module for patient education [8]. Self instructional module was found to significantly increase awareness of the cultural background of patients from a minority community and this knowledge was maintained for at least one month after distribution. The self-instructional material is not only effective in increasing the patient's knowledge but has also been used by other health care professional[9].

Self-education has also been widely used in the nursing practice and in light of the current nursing shortage; registered nurses who have been away from clinical practice are a valuable resource [10]. It was concluded that genetics self-instructional module for registered nurses was effective in increasing knowledge of basic human genetic concepts and risk assessment. Self-education is being used effectively in nursing practice to improve the nursing care as well as to improve the knowledge of nurses in various aspects[11]. Another Study concluded that there was a significant increase knowledge related to all aspects of chest tube drainage and its care[12]. There was significant increase in the knowledge of caregivers. This provides substantial support of education its usefulness and dependability as a teaching strategy [13]. Studies have shown that information booklet is effective as a teaching method in increasing the knowledge of patients and health care professional's especially nurses [14]. A descriptive study was conducted on nurses on legal aspects, which revealed that the level of knowledge was very less, but there was significant increase in their knowledge after introducing planned teaching regarding legal aspects [15].

Kadam, A.(2014) found that Structured education programme was highly effective to improve the knowledge score and to improve the attitude score of subjects/ caregiver

towards colostomy care of patient [16]. Anjum, S.(2014) conducted study to assess knowledge of contraceptives methods and appraisal of health education among married women and concluded After the health education married women knowledge was improved to 100% about female sterilization followed by condom 99%, skin implants 86%, oral pills 85% and emergency contraceptives 85%. Sociodemographic variable were significantly associated with existing knowledge and level of married women specially age at marriage, age at first child, occupation,, income ,education [17]. Babu, R. L. (2014) the findings of the study concluded that care takers had inadequate knowledge regarding non-curative care of terminally ill cancer patients. The planned education programme on non-curative care of terminally ill cancer patients was highly effective in improving the knowledge of care takers regarding non-curative care of terminally ill cancer patients [18]. Shinde,M.(2014) concluded that demonstration regarding feeding of hemiplegic patient among caregivers was effective in increasing the skill of the caregivers regarding feeding of hemiplegic patient[19], Structured Education were effective on Knowledge and Practice Regarding Venous Access Device Care among Nurses[20], Structured Education effective Regarding Menstrual Hygiene Practices among Adolescent Girls[21]. Effectiveness of Slow Back Massage was effective on Quality of Sleep among ICU Patient's [22].

#### 3.2 Literature Review Related to Anatomy & Physiology of Heart

The heart is a muscular organ with four chambers. Blood collects in the heart's two upper chambers, or atria, before filling the two lower chambers, or ventricles. When the ventricles contract, blood in the right ventricle is pumped to the lungs and blood in the left ventricle is pumped to the rest of the body [23].

The heart has a natural pacemaker called the sinoatrial node, or SA node. The pacemaker controls the heart rate by precisely determining when the muscles of the atria and ventricles contract. The electrical signal produced by the SA node reaches the ventricles through a narrow pathway that includes the so-called AV node and bundle branches. Taken together, these pathways are referred to as the conduction system of the heart.

Cardiac pacing is a widely accepted treatment for patients with a malfunctioning natural pacemaker, which causes the heartbeat to be too fast, too slow, irregular, or to present a blocked electrical pathway. In addition to being a life-saving procedure, pacemaker implantation restores regular heart rhythm and improves patient quality of life. The Pacemaker/ICD Technician is trained to participate in the care of patients requiring cardiac device therapy [23].

The heart is the pump responsible for maintaining adequate circulation of oxygenated blood around the vascular network of the body. It is a four-chamber pump, with the right side receiving deoxygenated blood from the body at low pressure and pumping it to the lungs (the pulmonary circulation) and the left side receiving oxygenated blood from the lungs and

pumping it at high pressure around the body (the systemic circulation) [24].

The myocardium (cardiac muscle) is a specialised form of muscle, consisting of individual cells joined by electrical connections. The contraction of each cell is produced by a rise in intracellular calcium concentration leading to spontaneous depolarisation, and as each cell is electrically connected to its neighbour, contraction of one cell leads to a wave of depolarisation and contraction across the myocardium [24].

This depolarisation and contraction of the heart is controlled by a specialised group of cells localised in the sino-atrial node in the right atrium- the pacemaker cells.

### 3.3 Literature Review Related to Knowledge About Pacemaker

A study was conducted on MRI in patients with cardiac implantable electronic devices. According to Cronin EM, Mahon N, Wilkoff BL, MRI is a powerful diagnostic tool; however, it is relatively contraindicated for patients with cardiovascular implantable electronic devices (CIEDs) such as pacemakers and implantable defibrillators. Several interactions with CIEDs have the potential to cause harm and fatalities. Limited experience of MRI in patients with CIEDs under close supervision and utilizing specific scanning protocols has emerged from a small number of centers. Even then, adverse effects on the CIEDs have been reported. The recent development of MRI-conditional pacemaker systems and the demonstration of safe magnetic resonance scanning in a large clinical trial is a significant advance in the care of patients with CIEDs, opening up this important imaging modality to those whom it was previously denied to. Further development of MRI-conditional CIEDs, including implantable cardioverter-defibrillators, is expected but presents many technological challenges [25].

An experimental study, using a pre-test – post-test control group design, was conducted in a 570 bed acute care teaching hospital. Its purpose was to evaluate the effect of planned patient teaching and psychological support on the ability of the elderly patients to adapt to the surgical insertion of a permanent cardiac pacemaker. Nine subjects, who met the study criteria, were randomly assigned to either the experimental or control group. Each subject was asked if he would like to include a significant other in the project. The members of the experimental group (5 patients, 3 significant others) were seen individually by the nurse investigator on or close to the third, fourth and fifth postoperative day at which time their questions were answered, they were given the opportunity to express their concerns and, they were shown a 15 minute slide-tape programme about pacemakers. The members of the control group (4 patients, 4 significant others) were provided with the usual nursing care given by the ward nursing staff. All patients received a booklet from the *company supplying their specific type of pacemaker*.

A study was performed to test the protection offered by electromagnetic filters of cardiac pacemakers against

cellular phone ringing. Investigators performed 330 consecutive tests in 158 patients at the time of routine examination in pacemaker follow-up clinic. The programmed parameters remained unchanged before testing. During electrocardiographic monitoring, 2 single-band digital cellular phones consecutively placed over the pacemaker pocket each received a call. The phone systems tested were 1) GSM at a maximal power output of 2 W, operating on a 900 MHz carrier frequency, and 2) PCS at a maximal output of 1 W, operating on an 1800 MHz carrier frequency. Interference was noted in only 5 tests, due to interaction by the GSM system with 4 unprotected pacemaker models. The GSM test was negative in 12 other tests of identical pulse generator models. The overall incidence of interference was 1.5% of tests. Interference by cellular phone ringing occurred only with unprotected pacemaker models. Standard programming of these unprotected models was associated with a low incidence of interference [26].

### 3.4 Literature Review Related to Care of Pacemaker

A study conducted on pacemaker endocarditis due to *Candida albicans* by Ve'ronique Joly et al. Investigators described a case of pacemaker endocarditis due to *Candida albicans* in a patient who responded favourably to combine surgical and antifungal therapy. Only five cases of candidal pacemaker endocarditis have been reported previously. Investigators review these five cases and discuss the clinical presentation and therapy for this disease in comparison with candidal prosthetic valve endocarditis. Investigators concluded that, candidal pacemaker endocarditis remains rare. This disease shares with candidal prosthetic valve endocarditis features that should help in its diagnosis. As in other candidal intravascular device infections, early aggressive combined surgical and medical therapy is advocated. This infection may represent one of the most severe forms of pacemaker endocarditis [27].

According to this study, the rate of malfunction and the clinical effects of failure are the primary considerations in the replacement of a recalled implantable pacemaker or cardioverter-defibrillator. After an advisory warning has been issued, the decision to replace a possibly defective implanted cardiac device can be a complicated one: the risk of replacement can outweigh the risk of potential malfunction. To help clinicians make such a decision, investigators devised a model for the evaluation of the risks and benefits associated with two possible treatment options- immediate replacements and continued monitoring. Investigators found that the significant variables for clinicians to consider are the rate of failure of the device, the consequences if failure occurs, and to a lesser extent, the mortality rate associated with replacement. The decision model was constructed with the life expectancy associated with each strategy as the primary end point; the key variables considered were the initial reason for insertion of the device (the prevention of sudden cardiac death, therapy for ventricular tachycardia or atrioventricular block, for example), the probable clinical outcome in the event of a malfunction, the rate of failure cited in an advisory warning, and the mortality rate associated with its replacement. The

investigators conducted probability and sensitivity analyses oriented towards three primary clinical outcomes-failure of the device producing great risk of immediate death, the risk of later death related to an event such as ventricular tachycardia, or symptoms with little risk of death. Investigators found that when the patient is entirely dependent on a pacemaker and its rate of failure is cited as more than 0.3%, replacement is warranted. In patients with cardioverter-defibrillators implanted primarily to correct a ventricular tachyarrhythmia, a 3% failure rate was found to be the threshold warranting replacement of the device, but that rate could be lowered to almost 1% as procedure mortality rates decrease to 0.1% or the risk of fatal arrhythmias increases to 20% per year. Generally, patients considered to be at low risk for deaths resulting from an underlying cardiac condition were determined to benefit most from ongoing monitoring and not replacement of a cardiac device. The investigators conclude that the risks of replacing a device outweigh the benefits in most cases, unless the rate of failure associated with it is very great [28].

#### 4.Statement of the Problem

**“A study to assess the effectiveness of information booklet on the knowledge of home care of pacemaker among the patients with complete heart block attending cardiology OPD, in selected hospitals in Mumbai.”**

##### 4.1 Objectives

1. To assess the knowledge of patients regarding pacemaker before the administration of the information booklet.
2. To assess the effectiveness of information booklet on home care of pacemaker among the patients with complete heart block.
3. To find out the relationship of effectiveness of information booklet in relation to care of pacemaker with selected demographic attributes.(e.g. age, gender, religion, educational qualification)

##### 4.2 Operational Definitions

###### 1) Study:

In this study, the word *study* means to find out the level of knowledge of patients regarding the homecare of the pacemaker.

###### 2) Assess:

In this study the *assess* means to find out the level of knowledge of patients regarding the homecare of the pacemaker.

###### 3) Effectiveness:

In this study, *effectiveness* is outcome of information booklet given by the investigator to patients regarding the homecare of the pacemaker.

###### 4) Information: -

In this study, *information* refers to knowledge provided by investigator to patients with complete heart block attending cardiology OPD.

###### 5) Booklet:

In this study *booklet* means a small, thin book giving first- hand information about home care of pacemaker.

###### 6) Knowledge:

In this study *knowledge* means the information which the patient already has about the homecare of pacemaker.

###### 7) Pacemaker:

In this study *Pacemaker* means an artificial device implanted for stimulating & regulating the heart muscle.

###### 8) Patient :

In this study, *patient* refers to the person who has a complete heart block, attending cardiology OPD.

#### 4.3 Research Methodology

##### 4.3.1 Research Approach

According to Shinde M (1993), research approach refers to the overall plan for obtaining answers to the research questions and for testing hypothesis. The research approach explains the basic procedure for conduct of research inquiry. The research approach was selected keeping in mind the objectives of the study. The research approach used in this study was a pre-experimental approach. In this study, the descriptive evaluatory approach helped the investigator to describe the knowledge of patients regarding homecare of pacemaker.

##### 4.3.2 RESEARCH DESIGN

One group pre test post test design was used.

###### • Dependent Variable

Dependent variable in this study is knowledge of patients in relation to homecare of pacemaker.

###### • Independent Variables

The independent variable in this study is information booklet on homecare of pacemaker.

##### 4.3.3 Setting of the Research Study

The proposed study was conducted at Cardiology OPD of selected Government hospitals of Metropolitan city.

##### 4.3.4 Sampling Technique

In this study, convenient sampling technique was used.

##### 4.3.5 Subject Size

The subject size for this study consisted of thirty patients with implanted pacemaker.

###### • Inclusion criteria: -

- 1) Patients who are willing to participate
- 2) Patients who have an implanted pacemaker
- 3) Patients present during study but did not receive any teachings on homecare of pacemaker.

###### • Exclusive criteria: -

- 1) Patients who are not willing to participate.
- 2) Patients participated in pilot study.
- 3) Patients who are not attending the cardiology OPD.
- 4) Patients who are illiterate.



## 5. Plan for Data Analysis

### Data Analysis and Interpretation

The data were analyzed in terms of the objectives of the study:

- Consolidated and organized the data in Master Sheet.
- Data scoring and coding was done.
- Frequency and percentage for the analysis of demographic characteristics of the respondent such as age, sex, education, occupation and income.
- Frequency and percentage was tested by t-test.
- Data was interpreted in the form of tables and graphs.
- Analysis of overall knowledge gained from information booklet will be done by mean score and Standard Deviation score and comparison between pre test and post test of two variables will be calculated by using t test.
- Comparison between pre test knowledge score and post test knowledge score of patients with pacemaker about homecare of pacemaker. Difference will be shown by mean and t test will be calculated.
- Relation of pre test and post test knowledge score of variables will be shown by pre-test post-test score difference and percentage change in knowledge.

## 6. Findings of the Study

The findings of the study were analyzed by using frequency, percentage distribution and t test and ANOVA was used to assess the effectiveness of information booklet and association of demographic variables.

### Findings in relation to the demographic variable:

Maximum subject 12 (40 %) belonged to age group of 35-44 years. Most of subject that is 19 (63.3%) were female. Majority 11(36.7%) of the subject had studied till secondary School. Largest component of the subject that is 11(36.7) were belongs to business category. Highest subject 19 (63.3 %), belongs to the Rs. 5,001 to Rs.10,000 income /month.

### Assessment and comparison of level of knowledge regarding home care of pacemaker among the patients with complete heart block attending cardiology OPD analyzed in terms of frequency and percentage.

In pre test maximum 21(70%) subject had average knowledge followed by 9(30%) with good knowledge and none of the subject were in good and average range. The post test score reveals that maximum subject 26(86.7%) were had good knowledge and 4(13.3%) belong to excellent none of the subject belong to poor and average. After information booklet there was a boost in the number of subject from poor and average range to excellent range after administration of information booklet.

### Evaluation of the effectiveness of information booklet by comparing pre-test and post test knowledge scores of subject analyzed in terms of t test to find out the level of significance and proving of hypothesis.

The calculated 't' value was found to be 19.55 for knowledge. As the calculated value was greater than the table 't' value 2.04 at 0.05 level of significance with the degrees of freedom 29 so null hypothesis ( $H_0$ ) was rejected. This shows that there was a significant difference in the mean of pre and post test knowledge score of the subject. These results support the effectiveness of information booklet in the improvement of knowledge score among the patients with complete heart block attending cardiology. Overall, the analysis and interpretation revealed that the information booklet was an effective for improving the knowledge among the patients with complete heart block attending cardiology OPD.

### Association of knowledge with demographic variables

Analysis and interpretation of data in order to find out association of pre test score with selected demographic variable as, age in years, gender, educational status, occupation, family income. The findings of the study shows that, there is no association exists between knowledge score after administration of information booklet with selected demographic variable as, age in years, gender, educational status, occupation, family income. The entire demographic variables are working independently.

## 7. Scope of the Study

- 1) The patients may be aware of the homecare of a pacemaker as per the informational booklet given to them.
- 2) The patients who have received information will be in a better position in managing the pacemaker at home.

## 8. Limitations

- 1) The study is limited to those patients who are attending cardiology OPD.
- 2) The study is limited to those patients who already have a pacemaker implanted.

## 9. Ethical Consideration:

- 1) Informed consent of the subject will be taken prior to the study.
- 2) Wellbeing of the subject is protected in the study.
- 3) Confidentiality of data is maintained and privacy of the subject is maintained.
- 4) Self-respect and dignity of the subject will be maintained during the study.

### 9.1 Nursing Services

Nurses have an important role to play in the care of patients with pacemaker in hospital as well as community health. This study can be used as an informative illustration for staff nurses working in pre and post operative ward as well as ICCU for taking care of patients with cardiac pacemaker specially preparing patients and patients relative for discharge planning. This study can be used as an informative illustration for community health nurses working in community for taking care of patients who have cardiac pace maker. This study brings to light the effectiveness of

pacemaker patients care at home in the treatment and prevention of complication in patients. Thus the nurses working in OPD, wards, day care centers, community area, can make use of this intervention and stress the health education on above aspect.

## 9.2 Nursing Administration

To improve the nursing care provided, the nurse administrator could use the findings of this study, as a basis for in- service education for the nurses. The finding of the study can help the nurse administrator to formulate policies for patients with cardiac pacemaker.

## 9.3 Nursing Education:

Nursing Education is a means through which nurses are prepared for practice in various settings. The result of the study can be used, by nursing teacher as an informative illustration to nursing students while teaching care of patients with pacemaker.

This study can be used as an informative illustration for students. The nurse educators can also highlight the benefits of the health education by using planned teaching programme as well as information booklet. The nursing students should be made aware about their role as a health educator for patients and relative with cardiac pacemaker. Students can be asked to conduct a programme, exhibition and demonstration to spread the awareness and importance of care of cardiac pacemaker.

## 9.4 Nursing Research

Another research has been added to the nursing care literature. The tool, technique and literature review can provide an avenue for further research studies. It certainly increases the body of knowledge and can be used as reference materials in the future. The suggestions and recommendations can be utilized by other investigators conducting further study in the same field.

## 10. Limitations of the Study

1. The study is limited to only home care of patients with cardiac pacemaker
2. The study was limited to only small group of patients.
3. The results cannot be generalized due to small number of subjects and restricted time period.
4. No attempt is made to compare and correlate the learning needs and self efforts to upgrade knowledge and practices.
5. No efforts are made to do collect direct observation of practices data of the patients

## 11. Sggestions for Improving the Present Study

- The study can include demonstration of some of the procedures and see the effectiveness.
- Larger subjects can be taken in the study for the purpose

of generalization.

- A randomized sampling technique could be effective in controlling extraneous variables.
- Practices can be observed directly and analyzed.
- Detail study about diet, activity, investigation etc. can be observed in detail which is very important part of home care of pace maker.
  1. A study can be done on practices regarding various complication and management and revised management guidelines.
  2. Different teaching strategies can be used to educate the patients and relatives regarding homecare of pacemaker.

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