

## Home-Care Program for Patients with Permanent Pacemaker

Shimaa.M.Abd El-Aziz<sup>1</sup>, Hanaa.A.Abd El-Megeed<sup>2</sup>, Samah.S.Sabry<sup>2</sup> and Mona.A.Abdel-Mordy<sup>2</sup>

<sup>1</sup>(M.Sc. Nursing-2018) Nursing Specialist Elhayah Hospital-Pour Saïdex I`

<sup>2</sup>Community Health Nursing Dept., Faculty of Nursing-Benha University

E-mail: shaimaashalaby030@gmail.com

### Abstract

**Background:-** Pacemakers are devices that can be placed in the body, usually by surgery to support the electrical system in the heart stabilize abnormal heart rhythms and home care to prevent problems that can disrupt or endanger life. **The aim** of this study was to evaluate the effect of home-care program for patients with permanent pacemaker. **Research's design:** A quasi experimental design was utilized for this study. **Setting:** The study was conducted at National Heart Institution Cairo, Egypt(Cardiology department to get patients addresses) to collect the sample and followed by home visits. **Sampling:** simple random sample was recruited and included 364 patients who had permanent pacemaker insertion. **Tools:-** two tools were used. **Tool I:** A structured interviewing questionnaire divided in three parts. **Part I:** (A) socio- demographic characteristics of studied sample. **Part II:** medical history of the studied sample. **Part III:** Knowledge of studied sample. **Tool II:** Observational checklist filled by researcher during home visits, which covered two parts. **Part I:** Practices of patients at home regarding recovery after surgery to prevent complications. **Part II:** Home environment of the studied sample. **Results:**60.4 % of the studied sample were males, 21% cannot read & write, 50.8% of them made dual-chamber pacemaker, 42.3% of them hospitalized due to bradycardia, 34.6% of them had average total knowledge score about permanent pacemaker device and home care after recovery in preprogram, while 88.2% of them had good total knowledge score about surgery and home care in post program, 40.4% of them had satisfactory practices in pre-program, while 59.6% of them had satisfactory practices in post program, 75.2% of them had moderate in home condition and found positive statistical correlation between total knowledge and practices of patients through program **This study recommended** that emphasize the importance of providing support and appropriate follow up care for patients with permanent pacemaker in outpatient clinics by a specialized team in order to prevent complication and future researches should be applied for large number of patients to provide home care management program after permanent pacemaker surgery .

**Keywords:** Home-care, Program for Patients, Permanent Pacemaker.

### 1. Introduction

The Human Heart is one of the most vital organs of the body as it is responsible for pumping blood all throughout the body and maintaining the health of the heart is also very important because hypertension, tachycardia or bradycardia can affect on the heart to become weak and eventually lead to insert pacemaker [1]

Pacemakers are devices that can be placed in the body, usually by surgery to support the electrical system in the heart, stabilize abnormal heart rhythms and prevent problems that can disrupt or endanger life. It is estimated that each year 1.25 million permanent pacemakers are implanted worldwide. In 2019, approximately 500,000 permanent pacemakers were implanted in Europe and there were 37,466 implants in Spain. The 2019 annual report of the Virgen del Rocío University Hospital indicates that 4790 permanent pacemakers were implanted [2].

Certain heart arrhythmias (malfunctions of heart's normal beating process), disruptions of heart's electrical system such as heart blocks, heart failure and history of heart attack can be treatable with a pacemaker [3].

chest pain, tachycardia (heart rate more than 100 beats per minute), bradycardia (heartbeat less than 60 beats per minute), heart palpitations, shortness of breath especially when more active, unexplained dizziness and nausea or fainting are symptoms that can determine if there's health problems and can be treated with a pacemaker and should tell to healthcare provider [4].

A specific type of pacemaker may be used

according to heart problem. Single-chamber pacemaker, dual-chamber pacemaker: biventricular pacemaker, healthcare provider may recommend a similar device called Cardiac Resynchronization Therapy (CRT) though it isn't a pacemaker, but used if heart is pumping too quickly or slowly, in either case, body doesn't get enough blood, this can cause: Fatigue, fainting dizziness, shortness of breath, damage to vital organs and eventual death [5].

Pacemakers help in improve quality of life and prevent disruptions caused by heart problems such as: chest pain, confusion, palpitations, nausea, confusion, preventing unpleasant symptoms like fainting that are caused by arrhythmias and saving life by preventing heart from stopping [6].

Pacemaker procedures tend to have few complications, which can discuss with healthcare provider, in general the following complications are possible: Allergic reactions, these may happen because of a medication or may be allergic to one of the materials used in the pacemaker itself, blood clots, malfunctions of the pacemaker or its leads that caused by sources outside of the body and unexpected heart rhythm problems [7].

The development of cardiac surgery and pacemaker implementation techniques has reduced the mortality rates of these surgeries to relatively low ranks. For instance, repairs of electrical heart defects are currently estimated to have 6-7% mortality rates. A major concern with cardiac surgery is the incidence of neurological damage. Stroke occurs in 4-5% of all people undergoing

cardiac surgery and is higher in patients at risk for stroke [8].

Home health care is a wide range of health care services that can be given to patients with permanent pacemaker in home after discharge from hospital. Home health care is usually less expensive, more convenient and effective as care patient get in a hospital or skilled nursing facility. The goal of home health care is to prevent any complication after implementation, help patient get better, regain independence and become as self-sufficient as possible [9].

The role of Community Health Nurse (CHN) is providing health education about permanent pacemaker to the studied sample after insertion, recovery and how to deal with pacemaker and prevents any complication. CHN giving the patients advices about avoiding rigorous exercise and heavy lifting also need to take over the counter medications for any discomfort, avoid keeping a cell phone or media player in the pocket over pacemaker, standing for too long near certain appliances such as microwaves, long exposures to metal detectors, high-voltage transformers, avoiding full-contact sports such as football, because contact could damage pacemaker or shake loose the wires in heart and taking a short walk or simply move arms and legs to aid blood circulation and quit before get tired [10].

#### Significance of the study:-

The Egyptian Society of Cardiovascular Surgery is delicate to improve patient care by advancing the knowledge and practice of cardiovascular surgery. Number of cases that made pacemaker in all hospital in Egypt around 7865 and in National Heart Institute made 4000 case in the year of (2018), other study showed that incidence and prevalence of pacemaker insertions in Egypt 6782 during 2015-2017 and prevalence rose across the study period exceeding 1 in 50 among people aged 75 or older from 2015 and was underpinned by incidence rates which rose with age, being highest in those 85 years or older over 500/100 000 for men and over 200/100 000 for women, rates for patients over 75 were more than double the rates for those aged 65-74 years, women were around 40% of cases overall, using of double-chamber and triple-chamber pacing increased across the study period (10), so study done to introduce home-care program for patients with permanent pacemaker and prevent any complications after surgery.

#### Aim of the study

This study aims to evaluate the effect of home –care program for patients with permanent pacemaker through the following objectives:-

- 1- Assessing knowledge of patients related to pacemaker and home-care management.
- 2- Determining home –care practices of patients with permanent pacemaker.
- 3- Designing and implementing home-care program based on the previously detected needs of the patients.
- 4- Evaluating the degree of improvement in patient's knowledge and practices about permanent pacemaker.

#### Hypothesis

The patients with permanent pacemaker who undergoing the home-care program, knowledge and

practices regarding permanent pacemaker will be improved.

#### Subjects and Methods

##### Research design

A quasi experimental design was utilized to conduct this study.

##### Setting

The study was conducted at National Heart Institution Cairo, Egypt (Cardiology department to get patients addresses) to patients with permanent pacemaker because large number of patients attended to this hospital then followed by visiting the studied patients home to carry out the study.

##### Sampling:-

Simple random sample for patients was taken from the above mentioned setting; studied patients selected according to certain criteria: Inserted permanent pacemaker, age 20-80 years, attended to the previous setting in year of 2018 was 4000 case. According to equation  $n = N/1 + N(e)^2$  (Guilford & Frucher, 1973), so total number that was collected 364 case treated with insertion of permanent pacemaker and discharged to home .

##### Tools of data collection:-

Two tools were used to collect the data.

**The first tool:** - A structured interviewing questionnaire. It was developed by the researcher and revised by the supervisors based on literature review and written in simple clear Arabic language and consisted of three parts:-

**The first part:** - To assess socio- demographic characteristics of the studied sample. It included (9) questions such as; age, sex, Residence, marital status, occupation, monthly income, educational level, type of family, smoking.

**The second part:** - To assess medical history of the studied sample: - It included (12) question.

**The third part:** - To assess knowledge of the studied sample. **A-** Knowledge of the studied sample about permanent pacemaker which included (9) question. **B-** Knowledge of the studied sample about home care which included (7) questions.

##### Scoring system for total knowledge:-

For knowledge items was adapted as follows:

##### Total knowledge=32

The correct and complete answer was scored (2), the correct and incomplete answer was scored (1) and don't know was scored (0). The score of knowledge items was summed- up and the total divided by the number of the items, giving a mean score for the part . These scores were converted into a percent score. The total knowledge scores were considered good if the score of total knowledge >75% (>24 point), considered average if it equals 50-75% (16-24point) and considered poor if it less than 50% (less than 16 point).

**Second tool:-** Observational checklist were filled by the researcher during home visits and included two parts:-

**The first part:** - To assess practices of the studied sample at home regarding recovery after permanent pacemaker insertion to prevent complications which included wound care after surgery which include 4 questions, eating food which included 6 questions, avoid constipation which included 3 questions, medication

intake which included 4 questions, pain reliever which included 3 questions, physical activities which included 3 questions, wearing clothes which included 4 questions, taking a shower which included 4 questions, driving which included 2 questions, returning to work which include 2 questions, protecting the device from electrical disturbances which include 3 questions, protecting the device from cell phone which included 2 questions, checkup which included 3 questions protecting the device from movement which include 2 questions.

**Scoring system for patients total practices: Total practices=45**

Each question has two level of answer; done was scored (1), and not done was scored (0). The scores of the practices items were summed- up and the total divided by the number of the items, converted into a percent score. The total quality of practices was considered satisfactory if the score >60% (>27 point), and considered unsatisfactory if it less than 60%(<27 point).

**The second part:** To assess the studied samples environmental home and included (14) question. **Scoring system for the studied sample environmental home: Total home environment=28**

The scoring system was calculated as (2) scores for good, (1) for moderate environment and (0) for the poor environment. The total home environment scores were considered good if the score of total knowledge >70%, considered average if it equals 50-70%, and considered poor if it less than 50%.

**Reliability and content validity of the tool:**

**Content Reliability**

Reliability of the tools was applied by researcher for testing the internal consistency of the tool, by administration of the same subjects under similar condition on one or more occasion. Answers from repeated testing were compared (test-re-test reliability). knowledge Reliability Statistics Cronbach's Alpha of the studied sample= 0.798, while practice Reliability Statistics Cronbach's Alpha of the studied sample=0.852 and environment Reliability Statistics Cronbach's Alpha of the studied sample= 0.710

**Content validity**

The tools validity was done by five of faculty's staff nursing experts from Community Health Nursing department who reviewed the tools for clarity, relevance, comprehensive, applicability and easiness for implementation and according to their opinion minor modification were carried out.

**Administrative approval**

An official permission to carry out the study was obtained from Dean of the Faculty of Nursing -Banha University, the Head of Vascular Surgery and cardiac catheterization in National Heart Institution Cairo and the Dean of National Heart Institution Cairo. The title, objectives, study technique and tools were illustrated for cooperation, as well as to allow the researcher to prepare a regular arrangement with patients.

**Operational design:**

**Preparatory phase:**

Preparation of the study design and data collection tools was based on reviewing current, past, local and international related literature about permanent pacemaker by using the periodical journal, magazines,

books and computer search to contrast the tools and the home health care program.

**Ethical considerations:-**

The interviewing questionnaire would be conducted by the researcher for patients in the selected hospital, after getting of the necessary official permission from Dean of Faculty of Nursing/ Benha University to the administrators of the previously mentioned setting to conduct the study. The researcher introduced herself to the patients, asked the questions using simple Arabic language and informed about the privacy of their information, nature of the study, their right to withdraw and the confidentiality of their names.

**Pilot study**

Pilot study was carried out on 10% of the studied sample equal 36 patients to test the practicability, applicability and timing of data collection. Reliability was assessed to determine the extent to which the items in the questionnaire related to each other. No modifications were done to the questionnaire; therefore, the sample of the pilot study was included in the total study sample.

**Field work**

A written official letter was obtained from the Dean of the Faculty of Nursing, Benha University and delivered to the directors of selected setting in order to obtain their approval for conducting of the research after explaining its purpose. A verbal agreement was taken from every patient in the study after explanation of the study purpose. The study was carried out through four phases: Preparation, planning, implementation and evaluation. These phases were carried out from beginning of December 2020 to the end of February 2022. The previous mentioned setting was visited by the researchers two days/week (Saturday and Thursday) from 10.00 am to 3.00 pm, number of studied sample range between 10-15 sample per visit. The tools took about 30-60 minutes. Data collection took about 15 months. The researchers met the patients in the previous mention setting then followed by home visit in (Sunday and Friday)to implement the program.

**Planning phase**

The researcher planned the home care program after a review of literature built on the assessment of patients' knowledge obtained from the structured questionnaire sheet (tool one) and observations obtained by researcher observation checklist (tool two). This program included (6 sessions), contents and methods of teaching.

**Implementation phase**

The home care program was implemented at the vascular surgery and cardiac catheterization department in national heart institution The total time used in the program sessions is 6 hours (3 theoretical hours and 3 practical hours), program was conducted in 6 sessions and each session lasts for 60 minutes. Patients' educational and training needs were assessed in order to be met.

**Evaluation phase**

After the implementation of the program, the post-test was administered which was the same formats of pre-test in order to compare patients' knowledge and practices before and after program, this helped to evaluate the effect of the implemented program.

**Statistical analysis:**

The collected data were organized, tabulated and statistically analyzed using Statistical Package for the Social Sciences (SPSS) version 25. For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, comparison between two groups and more was done using Chi-square test ( $X^2$ ). For comparison between means of two groups pre and post program. Highly Significant (HS) was adopted at  $P < 0.001$ , Significant (S)  $P < 0.05$ , and not significant (NS)  $p > 0.05$  for interpretation of results of tests of significance. Pearson's correlation analysis was used for assessment of the interrelationship between patient's knowledge and practices, socio demographic & knowledge, practices.

**Results**

**Table (1):** Describes that; 60.4 % of studied sample were males, 47.8% of them aged from 60-80 years with mean age was  $54.95 \pm 15.34$ , 65.1% of them lived in rural areas, 28% of them were house wives, 54.9% of them were married and 47.3 % of them hadn't enough family monthly income.

This figure clears that; 21% of the studied sample were illiterate, 35% of them read and wrote, 24% of them had primary education, 13% of them had secondary education and 7% of them had university education and above.

This figure illustrates that; 58% of the studied sample had extended family and 42% of them had small family.

This figure shows that; 33.0% of the studied sample suffered from hypertension, 22% of them suffered from diabetes mellitus, 12.4% of them had chest

diseases, 7.4% of them suffered from kidney failure, 9.5% of them had coronary diseases, 9.1% of them had anemia and 6.6% of them didn't had any chronic diseases before.

Shows that; 60.4% of studied sample were smoking and 53.2% of them started to smoke from ten or more years ago, but 39.6% of them weren't smoking.

This figure clears that ; 3.6 % of the studied sample had good total knowledge score about permanent pacemaker and home care after surgery pre program implementation and this percentage increased to 88.2% post program implementation,

34.6 % of them had average total knowledge score pre program implementation and this percentage reached to 9.9% post program implementation and 61.8% of them had poor total knowledge score pre program implementation and this percentage decreased to 1.9% post program implementation.

This figure clears that; 40.4% of the studied sample had satisfactory total practices score at home pre program and this percentage increased to 59.6 % post program implementation, 86.3 % of them had unsatisfactory total practices at home pre program implementation and this percentage decreased to 13.7% post program implementation.

This figure clears that; 23.4% of studied sample had good total home environment, 75.2% of them had moderate total home environment, 1.4% of them had poor total home environment.

**Table (2)** Shows that; there was positive statistically correlation between the studied sample total knowledge score and their total practice score pre and post program implementation.

**Table (1)** Frequency distribution of the studied sample according to their socio-demographic characteristic (n=364).

Socio-demographic characteristics	NO	%
<b>Age ( years)</b>		
20<40	66	18.1
40<60	124	34.1
60-80	174	47.8
	<b>Mean <math>\pm</math> SD 54.95 <math>\pm</math>15.34</b>	
<b>Sex</b>		
Male	220	60.4
Female	144	39.6
<b>Residence</b>		
Rural	237	65.1
Urban	127	34.9
<b>Marital status</b>		
Single	37	10.2
Married	200	54.9
Widow /Widower	76	20.9
Divorce	51	14.0
<b>Occupation</b>		
Government employee	55	15.1
House wife	102	28.0
Free business	96	26.4
Retirement	68	18.7
Not working	43	11.8
<b>Family monthly income</b>		
Enough	123	33.8
Enough &save	69	19.0
Not enough	172	47.3

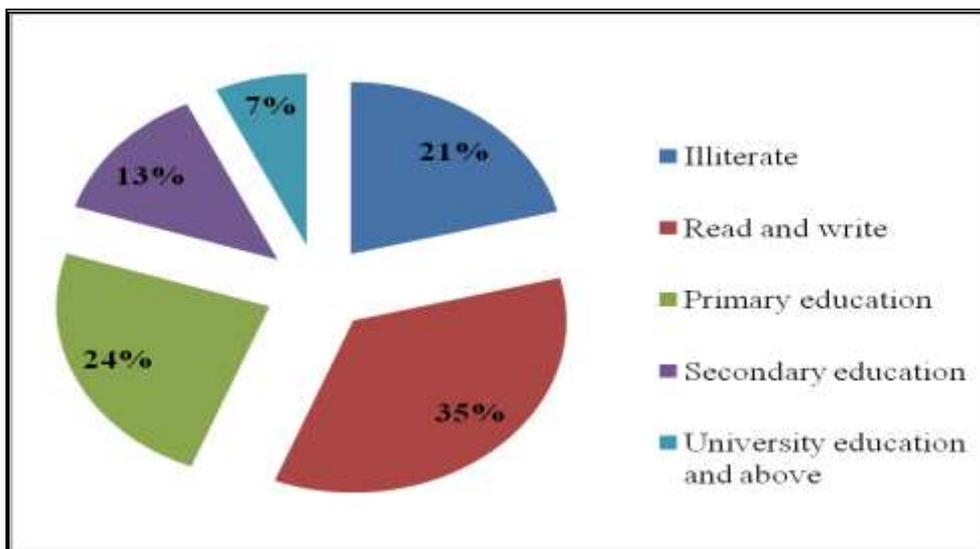


Fig. (1) Percentage distribution of the studied sample according to their educational level (n=364).

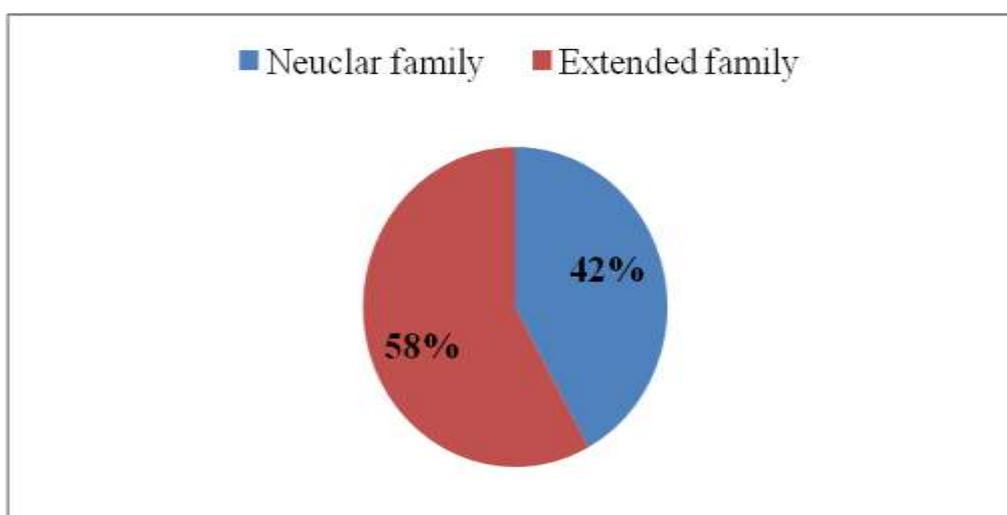


Fig. (2) Percentage distribution of the studied sample according to their family type (n= 364).

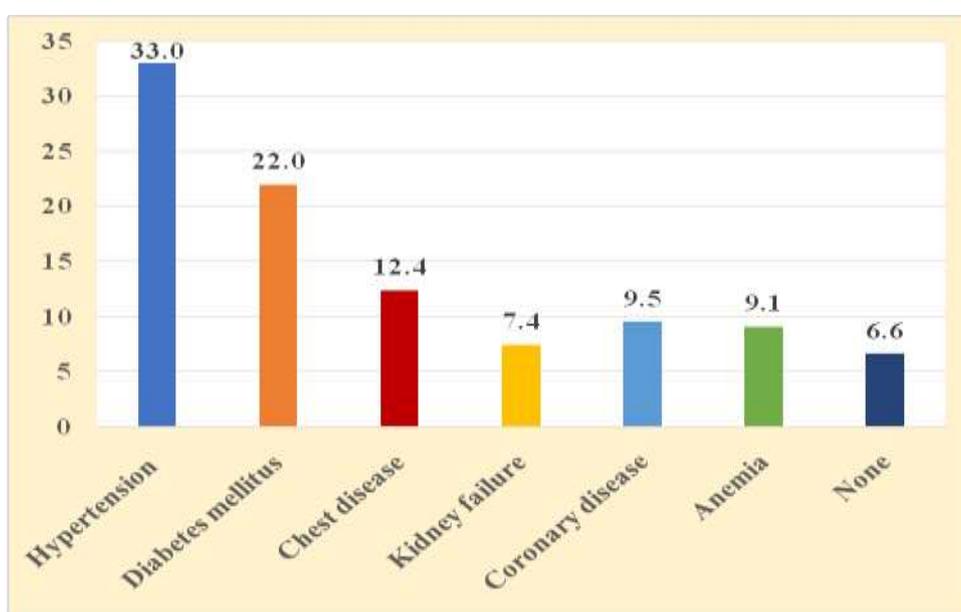
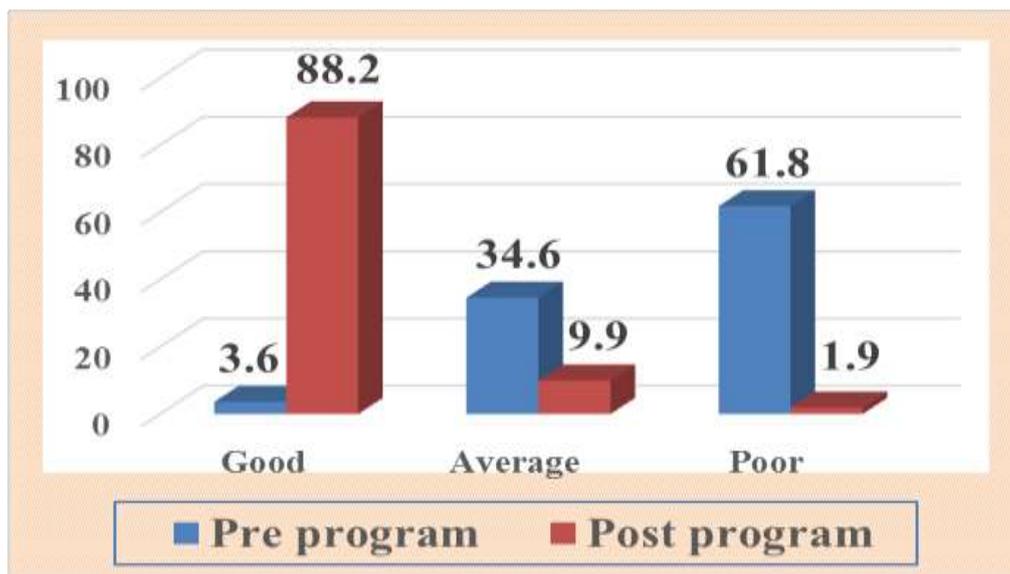
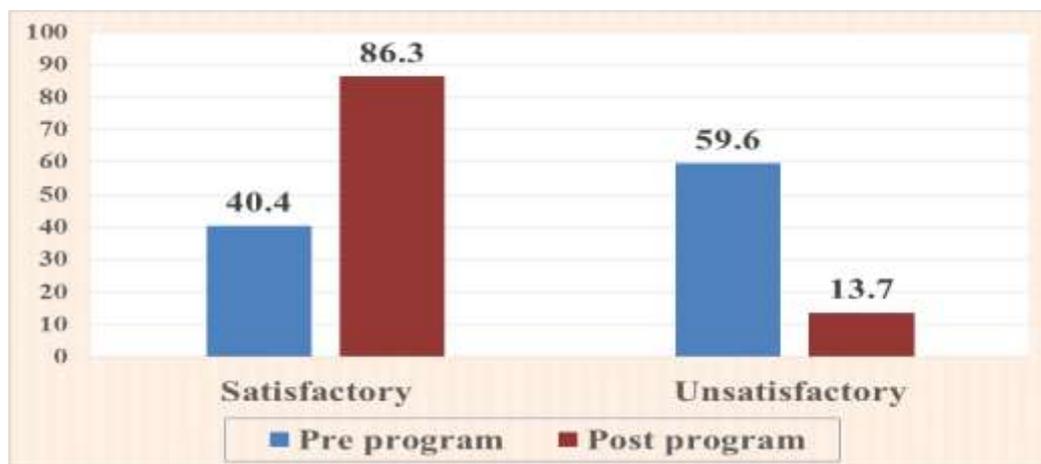


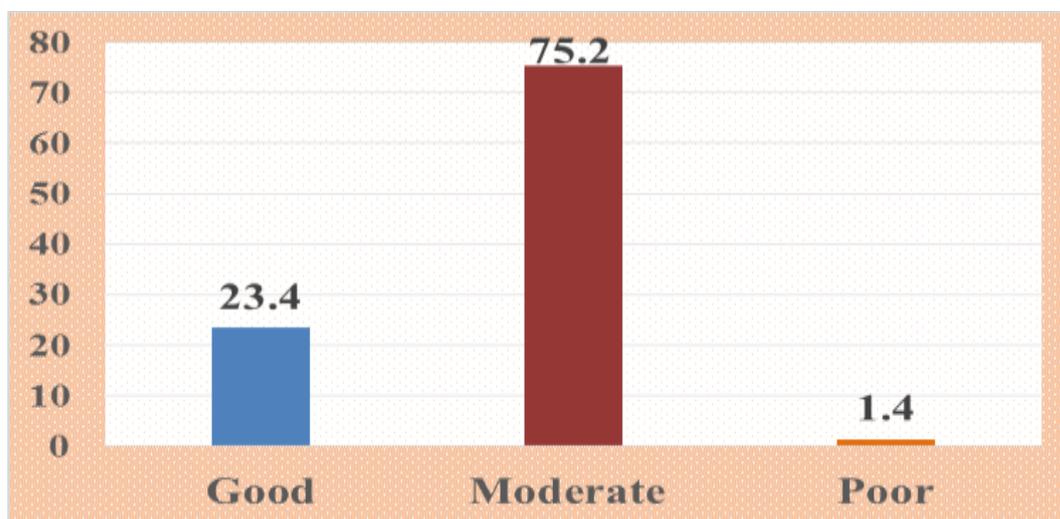
Fig. (3) Percentage distribution of the studied sample according to their chronic diseases (n= 364).



**Fig. (6)** Percentage distribution of the studied sample according to total knowledge score pre and post program implementation (n=364).



**Fig. (7)** Percentage distribution of the studied sample according to their total practices score at home pre and post program implementation (n=364).



**Fig. (8)** Percentage distribution of the studied sample according to total home environment score (n=364).

**Table (2)** Correlation between the studied samples total knowledge score and their total practices score pre and post program implementation (n=364)

Variables	Total knowledge score			
	Pre program n=364		Post program n=364	
	r	P-value	r	P-value
<b>Total practices score</b>	0.523	0.000**	0.629**	0.000**

### Discussion

A pacemaker is a device that is surgically implanted under the skin of the chest to create the electrical pulses that regulate heartbeats, used for long-term correction of a too-slow heartbeat (arrhythmia) and have been shown to be effective in enhancing quality of life. Although the surgery is considered to be low risk, around 3% of pacemaker recipients will experience some form of complication ranging from mild and treatable to potentially life-threatening [11]

Home-care is defined as the care taken by community health nursing towards patients with permanent pacemaker and encompasses the actions needed to lead a healthy life; meet one's social, emotional and psychological needs and to prevent further illness. Home-care is crucial for preventing complications, hospital readmissions, and emergency room visits [12].

Regarding to socio- demographic characteristics of the studied sample with permanent pacemaker, the results of the present study showed that; less than half of the studied sample aged from 60-80years with the mean age was  $54.95 \pm 15.34$  (table1). This finding was in the same line with the study done by [13] who studied " Analysis of Charges and Complications of Permanent Pacemaker Implantation in the Cardiac Catheterization Laboratory Versus the Operating Room in France" and found that 42.5% more than one third of their participants aged more than 63 years, also this finding was congruent with study done by [14] who studied " Evaluation and Management of Patients with Bradycardia and Cardiac Conduction Delay done in Italy" and found that, more than one third of the study participants was 65 years. This might be due to most heart patients resort to permanent pacemaker device after the failure of all medical treatments and this takes a long time.

Concerning sex of the studied sample, this study showed that more than half of them were males (table 1). This finding was in the same line with the study done by [15] who studied " Emotional and Physical Rehabilitation Protocol on Patients Undergoing Permanent Cardiac Pacemaker Implantation" done in Tiland and revealed that more than half of their studied sample were males, this might be due to men in the old time were drinking soda, coffee and squash in large quantities may increase the risk of insomnia and heart attack and eat plenty of foods rich in salts and saturated fats that increase the level of blood pressure.

However, this finding disagreed with study done by [16] who studied Knowledge Assessment of Patients

After Permanent Pacemaker Implantation regarding Home Care Management" in France and found that more than half of their participants were females.

Regarding residence of the studied sample, this study showed that more than half of them lived in rural areas (table1), this finding disagreed with the study done by [17] who studied " Implantation of 500 Consecutive Cardiac Pacemakers in the Electrophysiology Laboratory" in Sudan and reported that more than half of their subjects lived in urban areas, while agreed with study done by [18] who studied " The Impact of Counseling Program on Knowledge and Self-Efficacy of Patients with Implanted Permanent Pacemaker" in Ain Shams University Hospital, Cairo and reported that 63.7% patients with permanent pacemaker device in the department of cardiology within the clinical emergency country hospital Sibiu from 2019-2021, more than two quarter of their subjects were from rural areas and more than one quarter of them from urban.

Concerning the marital status in the present study, finding revealed that more than half of the studied sample were married (table1). This finding agreed with the study done by [19] who studied " Pacemaker and Implantable Cardioverter Defibrillator Implantation without Reversal of Warfarin" done in Malaysia and reported that more than half of their patients were predominantly married, while disagreed with study done by [20] who studied about " Sleep Disturbances after Cardiac Surgery done in Kuwait and found that less than three quarters from their subjects were married. This might be due to most of the patients are older marriage is a basic principle since ancient times and it was simple in the possibilities other than this present time and now a day's most of people suffer from high prices.

The results of the present study revealed that, more than one quarter of the studied patients work in free business (table1). This finding disagreed with the study done by [21] who studied " Knowledge and Practices Assessment of Patients after Permanent Pacemaker Insertion in Japan and found that more than half of their patients are government employees, also this finding was congruent with the study done by [22] who studied " Increased Bleeding Events With Continuation of Oral Anticoagulation Therapy for Patients Undergoing Cardiac Device done in Turkey and reported that less than half were working in free business. This might be due to increase the burdens of the day and high prices.

Concerning income, less than three quarter of the studied patients hadn't enough family income (table1). This finding disagreed with study done by [23] who

studied about " Heart Disease and Stroke Statistics in Kingdom and found that the sample was mainly more than half hadn't enough income and also disagreed with the study done by (24) and reported that, more than half of their sample income was sufficient. This might be due to high prices, high prices of living, high prices of medicines and most heart medicines are not available at the expense of the state.

As regard level of education, more than one third of the studied patients can read & write (figure1). This finding was in the same line with study done by [25] who studied " Pre-procedural Anticoagulation and the Incidence of Hematoma Formation after Permanent Pacemaker Implantation in elderly in Denmark and found that more than one third of their participants can read and write, also finding wasn't in the same line with study done by

(26) who studied " Assessment the Knowledge of Homecare Management of Permanent Pacemaker Implanted Patients in Scimst, Trivandrum and reported that more than two quarters of their patients had high school diploma.

Concerning type of family, less than three quarters of the studied sample had extended family (figure2). This finding disagreed with the study done by [27] who studied " Continuation of Warfarin during Pacemaker or Implantable Cardioverter-Defibrillator Implantation in Kingdom and found that, the sample was mainly less than half live in extended family, while result agreed with the study done by [28] who studied " Orphan Prevalence and Extended Family in a peri-urban Community in Zimbabwe" and reported that more than half of their sample live in extended family. This might be due to increase age of parents and recent increase in parental deaths, few differences in health, nutrition and education, low income of most of families, and they like extended family to prevent rupture of stressed community coping mechanisms.

Concerning past medical history for the studied sample, the results of the present study showed that, approximately more than one quarter of patients reported that hypertension was the main risk of heart disease (table2). This result consistent with the study done by [29] who studied " Effect of Hypertension on the Body done in America and found that more than half of their patients have high blood pressure. This might be due to uncontrolled blood pressure by medicine and they are not doing monthly check up for their health to predict and symptoms and solve before deterioration

Concerning past medical history for the studied sample, the results of the present study showed that, approximately more than one quarter of patients reported that hypertension was the main risk of heart disease (table2). This result consistent with the study done by [30] who studied " Effect of Hypertension on the Body done in America and found that more than half of their patients have high blood pressure. This might be due to uncontrolled blood pressure by medicine and they are not doing monthly check up for their health to predict and

symptoms and solve before deterioration.

Regarding to the total knowledge of the studied sample about permanent pacemaker and home care more than one quarter had average knowledge preprogram implementation, more than two thirds had good knowledge post program (figure 6) Result agreed with the study done by [31] who studied " The Effects of Symptom Management Intervention on Symptom Evaluation, Physical Functioning and Physical Activity for Women after Surgery in United Arab Emirates and found that after carry out cardiac rehabilitation program for their patients with heart surgery, which usually lasts at least six weeks, improved patient knowledge about recovery from the procedure, get back to everyday life as quickly as possible and adopt a healthy lifestyle. This might be due to reducing risk of developing further heart problems in the future for example, stop smoking, eat a healthy balanced diet, lose weight, stop alcohol intake, exercise regularly, and continue to take any medications as prescribed.

As regard total practices at home regarding permanent pacemaker device, it indicated that less than half of the studied sample had satisfactory total practices in pre program implementation and this percentage increased to less than two third post program implementation (table 21-figure7). This result agreed with study done by [32] who study " Heart Disease in the Family History in United States and reported that less than half of their patients had satisfactory total practices pre program implementation and this percentage increased to less than two thirds post program implementation.

In the current study there was positive statistically correlation between the studied sample total knowledge score and their total practices score pre and post program implementation (table 25). This finding agreed with the study done by [33] who studied " The Cardiac Rehabilitation Care Continuity through Automatic Referral Evaluation in South Asians and found that there's positive correlation between their patients total knowledge score and their total practice score pre and post program implementation.

Also this result agreed with the study done by [34] who studied *History of Cardiac Surgery* in Afghanistan and reported that their was positive correlation between their patients total knowledge score and their total practices score pre and post program implementation.

This result was disagreed with the study done by [35] who studied about " Evaluate the Effectiveness of Video Assisted Teaching Program on Knowledge and Practice Regarding Cardio Version and Defibrillation among Staff Nurses in Pakistan and reported that negative correlation between total knowledge and total practices of their patients pre and post program.

Also finding was disagreed with the study done by [36] who studied " Nutrition Knowledge, Meal Patterns and Nutritional Status of Energy in Egypt and reported that there's negative correlation between total knowledge and total practices of their patients pre and

post program, it might be due to old age of patients be able to effect on their practices.

### Conclusion

**Based on the results of the present study and research hypothesis, the study concluded that:**

The home care management program improve knowledge and practices for patients with permanent pacemaker, there were statistically significant between the studied sample socio demographic as age, marital status, occupation, educational level and their total knowledge score pre program implementation but post program implementation there were highly statistically relation between the studied sample socio demographic characteristics as age, residence, marital status, occupation and educational level and their total knowledge score. There were highly statistically relation between the studied sample socio demographic characteristics as age, residence, occupation and educational level and their total practices score pre program implementation but there were no statistically significant relation between their sex, family monthly income and their total practices score pre program implementation. There were statistically significant relation between the studied sample socio demographic as age, marital status and educational level and their total practices score post program implementation and there were no statistically significant relation between their sex, family monthly income and their total practices score post program implementation and there was positive statistically correlation between the studied sample total knowledge score and their total practices score pre and post program implementation.

### Recommendations

**Based on the results of the present study, the following recommendations were suggested:**

- Home care programs should be basic components of nursing educational programs especially those related to pre and post-operative care of permanent pacemaker patients.
- -Health educational programs about permanent pacemaker implementation should be provided to patients to provide knowledge, practices about device implementation, home care & prevent complication after surgery.
- Patient should maintain an exercise program for physical, mental, social, and psychological well-being. Exercising with others can create added motivation.
- Emphasize the importance of providing support and appropriate follow up care for permanent pacemaker patients in outpatient clinics by a specialized team in order to prevent complications.

•Written booklets, posters and videos should be available in each Cardiac Unit in hospital to acknowledge patients about permanent pacemaker surgery.

• Future researches should be applied for large number of patients to provide home care management program after permanent pacemaker surgery.

### References

- [1] Abu-Salem, S., Packer D., Boineau R., Domanski M., (2021): Emotional and Physical Rehabilitation Protocol on Patients Undergoing Permanent Cardiac Pacemaker Implantation, 113(12) pp.46 -47.
- [2] Allie, S., Erickson, N., Christopher, C., (2021): Assessment the Knowledge of Homecare Management of Permanent Pacemaker Implanted Patients, 2(3), pp.45-75.
- [3] Antony, O., (2020): Knowledge Assessment of Patients After Permanent Pacemaker Implantation Regarding Home Care Management, A textbook of cardiovascular medicine 9th ed., Elsevier, USA, pp.1245- 1270
- [4] Chow, X., (2020):Pre-procedural Anticoagulation and the Incidence of Hematoma Formation after Permanent Pacemaker Implantation in elderly, Ann Thorac. Surg., 79(32), pp.1724-1730.
- [5] Conkey, H., Bernstein, D., Daubert, C., Fletcher, D., (2017): Function of the permanent pacemaker, retrieved from <http://antranik.org/function-of-the-permanent-pacemaker-and-fibrous-skeleton>, access jenuary15, 4pm.
- [6] Demircan, H., Schoenfeld, M., Sutton, R., (2021):Impact of counseling program on knowledge and self-efficacy of patients with implanted permanent pacemaker. Journal of American Science,11(6), pp. 255-300.
- [7] Foster et al., (2022) who studied " Orphan Prevalence and Extended Family in a peri-urban Community in Zimbabwe, retrieved from <https://www.medicare.gov/what-medicare-covers/home-health-care/home-health-care>, access February 4,7pm.
- [8] Garcia, M., (2019): Implantation of 500 Consecutive cardiac pacemakers in the electrophysiology laboratory, Different heart diseases, retrieved from <http://www.world-heart-federation.org>, access jenuary5, 21pm.
- [9] Gögenur, R., (2020): Sleep Disturbances after Cardiac Surgery, retrieved from [http://www.who.int/cardiovascular\\_diseases/resources/atlas/en/](http://www.who.int/cardiovascular_diseases/resources/atlas/en/) access September6,3pm.
- [10] Halperin, U., Schron, I., Eleanor, B., Tolbert, O., (2021): Continuation of Warfarin during Pacemaker or Implantable Cardioverter-Defibrillator Implantation, 7th ed., warden publisher, united states, pp. 1–11.
- [11] Harvard, F., (2019): Knowledge and practices assessment of patients after permanent pacemaker insertion , Jones and Bartlett publishers, Japan , pp.123-147.
- [12] Harvard, H., (2020): Heart Disease in the Family

- History, retrieved from <http://study.com>, access June6, 10am.
- [13] Hayes, G., Hart L., Hole D., (2019): Increased Bleeding Events With Continuation of Oral Anticoagulation Therapy for Patients Undergoing Cardiac Device done in Turkey.
- [14] Hulzebos, S., Andrew, E., Erickson, F., Christopher, C., (2021): Novel treatment strategy for wound complications after pacemaker surgery Bioengineered pligraf. *The Annals of Thoracic Surgery*, 28(1), pp.230-234
- [15] Institute for Quality and Efficiency in Health Care, (2020): Cardiac Procedures and Surgeries, retrieved from <http://www.heart.org/heartorg> Conditions/heart attack/prevention treatment of heart attack, access august 5, 6pm.
- [16] James, E. (2021): Detection of new atrial fibrillation in patients with cardiac implanted electronic devices and factors associated with transition to higher device-detected atrial fibrillation burden. *Heart Rhythm. British Journal of Cardiac Nursing*, The University of Manchester Britain, 4(6), pp.261-269.
- [17] Jennifer, B., (2021): Indications, Safety, and Warnings, retrieved from <http://www.medtronic.com/us-en/healthcare-professionals/therapies-procedures/cardiovascular>, access jenuary25, 8am.
- [18] Jennifer, E., (2021): Nursing theory, retrieved from <http://www.nursing-theory.org/theories-and-models/>, access February 5, 2pm.
- [19] Link, P., Tynan, M., Gould, K., (2022): the Cardiac Rehabilitation Care Continuity through Automatic Referral Evaluation, <http://www.texashomevisiting.org/wp-content/Guidelines-for-home-visitors>, access Febreuary7, 9am.
- [20] Magdi, H., (2020): history of cardiac surgery retrieved from <http://www.sts.org/patient-information/adult-cardiac-surgery> access December 10, 7pm.
- [21] Mark, C., (2021): Evaluation of Nurses' practices provided to the Patients who undergo permanent pacemaker Surgery, *Kufa Journal for Nursing Sciences*, 79(2), pp. 33-39.
- [22] Medline Plus Medical Encyclopedia, (2020): Electrical problems in the heart retrieved from <http://www.heart.org/heartorg/conditions/more/heartelectrical-problems-and-disease/problem-heart-valve-s>, access jenuary8, 9pm.
- [23] Mohamed, B., (2019): Essentials in community health nursing practice, 1 st ed; Gopsons papers co., New Delhi, India, pp.324-344.
- [24] Mozaffarian, N., Mark, B., Gewitz, Z., Michael, Y., (2016): Heart Disease and Stroke Statistics, retrieved from <http://www.webmd.com/acu> access jenuary6, 7pm.
- [25] Nasr, Q., Wilson, G., Walter, R., (2021): The Impact of Counseling Program on Knowledge and Self-Efficacy of Patients with Implanted Permanent Pacemaker, *Ain Shams University hospital*, Cairo, 362(2), pp.7-75
- [26] Newal, K., Cartier, P., Honos, G., Durand, L., (2020): Nutrition Knowledge, Meal Patterns and Nutritional Status of Energy, retrieved from <http://www.sts.org/sites/default/files/t.pdf>, access March 4, 7pm.
- [27] Orem, H., (2020): Health Care and Medical Information, retrieved from <https://www.wikihow.com>, access march 12, 5pm.
- [28] Paul, R., (2019): Pacemaker and Implantable Cardioverter Defibrillator Implantation Without Reversal of Warfarin, retrieved from <http://www.fhi360.org> Managing Chronic Care HV, access February 7, 4am.
- [29] Pibarot, P., (2021): Textbook of medical surgical, 13ed. Canada, lipponcott Williams and wilkns comp., pp. 430- 435.
- [30] Rena, G., (2018): Compatibility Guide for Implantable Cardiac Devices. An integrative review. *Euro Journal Cardiovascular Nurs* 13, pp. 22-31
- [31] Ruzaljian, T., (2020): Emotional and physical rehabilitation protocol for patients undergoing permanent cardiac pacemaker implantation, retrieved from [www.bsu.edu/Backend/Uploads/PDF/Prof.](http://www.bsu.edu/Backend/Uploads/PDF/Prof.), july 23, 5pm.
- [32] (23) Suzan, D., (2021): Evaluation and Management of Patients with Bradycardia and Cardiac Conduction Delay, *Ann Thorac. Surg.*, 79(30), pp.1650-1677.
- [33] (33) Thomas, O., (2021): Evaluate the Effectiveness of Video Assisted Teaching Program on Knowledge and Practice Regarding Cardio Version and Defibrillation among Staff Nurses, of bagalkot , 2(3), pp.45-75.
- [34] (34) Van Slooten, R., Sharma, T., Parikshit, S., Vijayaraman, B., (2019): New Generation Pacemakers, <https://www.maxhealthcare.in/blogs/cardiac-retrieved-from-sciences-cardiology/new-generation-pacemakers>, July 12, 6pm.
- [35] (35) Yamamura, H., (2019): Analysis of Charges and Complications of Permanent Pacemaker Implantation in the Cardiac Catheterization Laboratory Versus the Operating Room, 2(6), pp. 493-500.
- [36] (36) Zimmerman, R., Stewart, S., Hart, C., Hole, D., (2020): the Effects of Symptom Management Intervention on Symptom Evaluation, Physical Functioning and Physical Activity for Women after Surgery, 20-year follow-up of the Renfrew/Paisley study. *Am Journal Med.*, 113(5), pp.423-456.