

▪ *Basic Research*

***Effect of a Health Education Nursing Intervention on Permanent Pacemaker Patients' Adherence to Care Practices and Daily Activities.***

Eman Abdeen Ali <sup>1</sup>, Soheir Mostafa Eweda <sup>2</sup>, Yousria Mohamed Salem <sup>3</sup>,  
Rasha Aly Yakout<sup>4</sup>, Mohamed Ibrahim Sanhoury<sup>5</sup>. <sup>1</sup>Assistant Lecturer –  
Medical Surgical Nursing / Faculty of nursing, Alexandria University, Egypt. <sup>2,3</sup>  
Professor of Medical - Surgical Nursing / Faculty of nursing, Alexandria  
University, Egypt. <sup>4</sup> Assistant Professor of Medical - Surgical Nursing / Faculty  
of nursing, Alexandria University, Egypt  
<sup>5</sup> Lecturer of Cardiology/ Faculty of Medicine, Alexandria University, Egypt  
[Rasha.yakout@alexu.edu.eg](mailto:Rasha.yakout@alexu.edu.eg)

**Abstract**

**Introduction:** Pacemaker safe care practices and long-term follow-up are necessary not only for safety of pacemaker patient but also for the adequate use of the pacing system. Patients must know the detailed restrictions and precautions in daily activity after pacemaker insertion to prevent many of complications. **Aim:** Evaluate the effect of a health education nursing intervention on permanent pacemaker patients' adherence to care practices and daily activities. **Research hypothesis:** Patients with permanent pacemaker who receive health education nursing intervention will exhibit higher mean scores on adherence to care practices, and on daily activities than those who receive the routine pacemaker care. **Methods:** A quasi experimental research design was utilized to conduct this study on 60 patients undergoing permanent cardiac pacemaker at Cardio-Electrophysiology Unit at the new Main University Hospital. **Tools:** Three tools were used for data collection. Tool I: Patient's socio-demographic and clinical data structured interview schedule, Tool II: Adherence with Pacemaker Care Practices Tool, Tool III: Daily Activities Tool.

**Results:** Statistically significant differences were found between the study and control groups in relation to adherence with pacemaker care practices and performing certain daily activities. Moreover, the majority patients in the study group were independent in their daily activities than those in the control group after application of health education nursing intervention. **Conclusion:** Adherence with pacemaker care practices and independency in daily activities

was better in the study group patients than those of the control group after application of health education nursing intervention. **Recommendations:** Developing in-service training program for nurses working with patients undergoing permanent pacemaker insertion regarding correct practices and activities after pacemaker insertion should be encouraged.

Key words: Permanent Pacemaker, Patients' Adherence, Care Practices, Daily Activities.

## 1. Introduction

A pacemaker (PM) is a small device that's placed under the skin in patient's chest to help in controlling irregular heartbeat (arrhythmia) (Tarun & Bashir, 2019). Although implantation of PM is a minimal invasive procedure, there is the potential for complications during or after implantation (Schmitt, 2016).

Most of these complications can be minimized by performing specific activities as care of incision site, early risk identification and continuous monitoring of the patient's condition. According to American Heart Association, permanent pacemaker patients must know the detailed restriction and precautions in their Activity of Daily Living (ADL) through effective nursing education and support (Sharma, Singh and Sharma, 2018).

Patient education and support are essential for enhancing self-care abilities, improving outcomes and decreasing unnecessary hospitalizations. In nursing education today, teaching and providing information to patients and relatives are of central importance (Olshansky & Hayes, 2016). Moreover, nurses can provide care to patients in all phases of pacemaker implantation. They have a role in preparing the helpful environment and assist in the implantation of the permanent pacemaker intra-operatively; in post implantation unit, they keep their eyes on patients for prevention of complications and provides individualistic holistic nursing care. They have an important role in helping patients and their families with rehabilitation care and adaptation to the new life. (Sharma, Singh, Sharma, 2018).

According to a study done by **Amara et al (2013)** on adult patients with pacemakers, it was found that the majority of patients with pacemaker considers performing many routine activities as unsafe like bending over , automobiles driving, sleeping on pacemaker side, passing through metal detectors, irons, electrical wall switches and using video cassette recorders/television (**Amara , 2013**). Pacemaker patients' insufficient knowledge potentially leads to disabling lifestyle modifications. Therefore adherence to correct pacemaker care practices is needed for adequate adjustment with pacemaker device (**Aqeel, Shafquat, Salahuddin, 2008**).

## **2. Significance of the study:**

Pacemaker patients' insufficient knowledge potentially leads to disabling lifestyle modifications.

Therefore, adherence to correct pacemaker care practices is needed for adequate adjustment with

pacemaker device

**3. Aim of the study:** This study aimed to evaluate the effect of a health education nursing intervention on permanent pacemaker patients' adherence to care practices and daily activities.

**4. Research hypothesis:** Patients with permanent pacemaker who receive health education nursing intervention will exhibit higher mean scores on adherence to care practices, and on daily activities than those who receive the routine pacemaker care.

## **5. Subjects and Methods**

**5.1. Research Design:** A quasi experimental research design, two groups post-test only were utilized to conduct this study.

**5.2. Setting:** The study was conducted at the Cardio- Electrophysiology Unit at the new Main University Hospital.

**5.3. Subjects:**

- A convenience sample of 60 adult patients with permanent cardiac pacemaker recruited in the study. They were randomly assigned into two equal study and control groups (30 patients in each group).
- The **Epi- info-7 program** was used to estimate the minimum sample size using the following parameters, population size of patients on permanent pacemaker over the year 2018 =200, expected frequency =50%, acceptable error = 10%, confidence coefficient = 95%, minimum simple size = 55 patients.
- **Inclusion criteria:** Patients with permanent cardiac pacemaker implantation aged from 20 up to 60 years old, both sexes (male & female), able to communicate verbally, not scheduled for other surgeries, agree to participate in the current study.
- **Exclusion criteria:** had psychotic disorders, and scheduled for other surgeries.

**5.4. Tools:**

Three tools were used for data collection:

**5.4.1. Tool I: Patient's Socio-demographic and Clinical Data Structured Interview Schedule:**

This tool was developed by the researcher after reviewing the related literature (**Al-Ahmad, et al 2018& Ali, Youssef, Mohamed, Hussein, 2015& Barold, Stroobandt, & Sinnaeve, 2010& Carrión-Camacho, Marín-León, Molina-Doñoro, González-López, 2019& Sharma , Singh and Sharma 2018& Timperley, Leeson, Mitchell, , Betts, 2019**). It composed of two parts:

**Part I:** Patient's Socio-demographic data such as; age, sex, residence area, marital status, level of education and occupation

**Part II:** Patient's history and clinical characteristics such as; clinical diagnosis, specific diagnostic tests as, ECG and echocardiogram, medication history., date of pacemaker implantation and previous family history of cardiac diseases such as complete heart block and heart failure.

#### **5.4.2. Tool II: Adherence with Pacemaker Care Practices Tool:**

- This tool was developed by **Sharma et al (2018)** to assess adherence of the patients to pacemaker care practices. It was adapted and translated into Arabic language by the researcher. It included items related to patients' adherence to care practices of pacemaker; as (monitoring pulse rate daily, avoiding pressure over pacemaker site, keeping cell phone opposite side of pacemaker, not performing exertional physical activities and not lifting arm above shoulder level.... etc).
- Each item was scored (1) mark for performing pacemaker care practice and (0) mark for not performing pacemaker care practice (S. Sharma K, Singh N and Sharma Y 2018). The scores obtained for each set of questions

were summed up and the total divided by the number of the items, giving a total mean score. Total patients' adherence score was calculated then converted to mean percent

score and classified as:

- Patients who had score less than 50% were considered as “non-adherent to pacemaker care practices”
- Patients who had score equal to 50% or higher, were considered as “adherent to pacemaker care practices”.

#### **5.4.3. Tool III: Daily Activities Tool:**

- This tool was developed by the researcher to evaluate daily activities of patients with permanent cardiac pacemaker after reviewing related literature (Amara et al., 2013; Brunner, 2017; Kurucová, Žiaková, Gurková, Šimková, 2014; Sharma, Singh, Sharma, 2018). It consisted of items which used to assess daily activities for patients with permanent pacemaker such as; (shopping, dressing, toileting, bathing, mode of transportation, feeding, --- etc.).
- Each item was scored through a 3 point Likert scale as; whether the patient can perform the task independently, with some assistance or dependently (0=dependent, 1=needs some assistance, and 2= independent). The scores of the items were summed-up and the total divided by the number of the items, giving a total mean score.

Scores from (0-10) i.e. (< 50 %) indicated dependence in daily activities, scores from (11- 16) i.e. (50-75%) indicated slight dependence (need assistance) and scores from (17-22) i.e. (>75%) indicated independence in daily activities.

### **5.5.Method:**

- Approval of the Ethical Committee of Faculty of Nursing, Alexandria University was obtained.
- An official letter from Faculty of Nursing, Alexandria University was submitted to head of cardiology department and head of cardio electrophysiology unit at the new Main University Hospital.
- An official permission to carry out the study was obtained from the head of cardiology department and cardio electrophysiology unit and the hospitals directors at the selected settings, after explanation of the aim of the study.

- Tools Validity: Tool I, III were developed by the researchers and translated into Arabic language., and tool II was adapted. Tools were submitted to five experts in the field of Cardiology, and Medical Surgical Nursing for content and construct validity and the necessary modifications were introduced accordingly.
- Reliability testing for the study tools (tool II and tool III) were estimated using the Cronbach's Alpha test and was equal (0.784 and 0.865 consequently) to measure its internal consistency to evaluate how well the tools consistently measure what they were designed to measure.
- A pilot study was initially carried out prior to the actual data collection phase on six patients to check clarity, feasibility and applicability of the tools and determine obstacles that may be encountered during period of data collection, accordingly, needed modifications were done. Pilot study subjects were excluded from the study.
- Data were collected in a period of 5 months from beginning of August 2020 to end of December 2020.
- Patients meeting the inclusion criteria were selected using convenience sampling technique and divided into two equal groups (control group and study group).
  - Group one (control group): received the routine hospital care as “wound dressing, medications administration, assessment of vital signs and hygienic care”. They didn’t receive the health education nursing intervention by the researcher.
  - Group two (study group): received the health education nursing intervention.

- The data were collected by the researcher for every patient using individualized interview and collected from the control group first then from the study group. to prevent any influence on the knowledge and practices of patients in the control group.

- **The study was carried out through the following steps:**

***In relation to the control group:***

- Every patient was interviewed on the day of the pacemaker implantation to collect sociodemographic data using tool I, then they were informed that they will be interviewed after three months of pacemaker implantation to collect the data related to their adherence to pacemaker care practices and daily activities using tool II and tool III.

***In relation to the study group:***

- On the day of the pacemaker implantation (before permanent pacemaker implantation), patients were interviewed individually to establish rapport and to collect sociodemographic data from each patient using tool I.
- Patients were informed that the researcher will meet them according to the hospital routine follow up policy (just before discharge from Cardiac Care Unit (CCU), after ten days, one month and three months) to complete the application and evaluation of the health education nursing intervention. Moreover, introduction of the health education nursing intervention, its important items, time schedule, purpose and benefits of it were given to the patients before their discharge.
- The health educational nursing intervention divided into three sessions. Each session consumed from 30-45 minutes for each patient.

**First session:** It was conducted just before patients' discharge from the CCU post permanent

---



pacemaker implantation. It comprised two parts:

*-The first part*; focused on teaching the patients about basic information related to the heart and the pacemaker.

*-The second part*; focused on teaching the patients the guidelines related to pacemaker care practices.

**Second session:** It was implemented after 10 days of pacemaker implantation (During patient's

follow up period to remove dressing of the wound). It focused on teaching the patients about some

guidelines related to his/her daily activities as; (bathing, dressing, transportation and feeding).

Re-explanation of items related to health education nursing intervention in the first session was done

and any question related to the two sessions was answered.

**Third session:**

- It was implemented after one month of pacemaker implantation. The guidelines related to daily activities were completed on this session. In addition, the guidelines given in the first and second session were revised in this session for more reinforcement.
- After three months of pacemaker implantation, every patient recruited in both groups was interviewed individually using tool II and tool III to evaluate the effect of a health education nursing intervention on permanent pacemaker patients' adherence to care practices and daily activities.
- Comparison between the study and control groups was carried out using appropriate statistical analysis in order to evaluate the effect of a health education nursing intervention on permanent pacemaker patients' adherence to care practices and daily activities.

- An Arabic handout booklet with colored pictures which was developed by the researcher based on review of the recent related literature (Brunner, 2017; Knapp, 2020; Kotsakou et al., 2015; Mulpuru, Madhavan, McLeod, Cha, & Friedman, 2017; Olson, 2014) was given to every patient in the study group from the beginning of the first session for more illustration of the health education contents.
- The educational contents were explained for every patient with power point presentation for more illustration. Also, phone contact was maintained between researcher and patients before each time of follow up.

#### **5.6. Ethical consideration:**

- Research proposal was approved from Ethical Committee in the Faculty of Nursing.
- The study was following common ethical principles in clinical research.
- Written informed consent was obtained from every patient, after explanation of aim of the study.
- Patients 'anonymity, confidentiality and privacy, were ascertained.
- Patients' right to withdraw at any time was considered and respected.

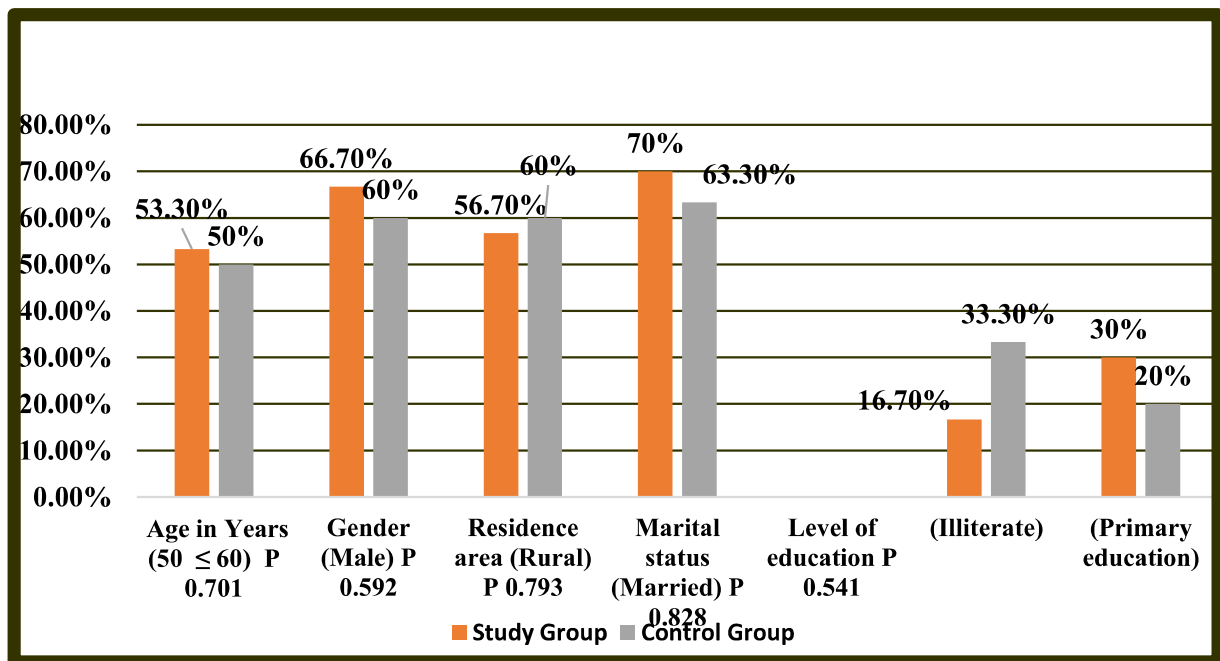
#### **5.7. Statistical analysis of the data:**

- After data were collected, they were coded and transferred into specially designed formats, so be suitable for computer feeding. Verification processes were carried out to avoid any errors during data entry.
  - The suitable statistical program was utilized (IBM SPSS software package version 20.0) (Armonk, NY: IBM Corp) for both data presentation and statistical analysis of results.
  - Qualitative data were described using number and percent and Quantitative data were described using range (minimum and maximum), mean and standard deviation. - Significance of the obtained results was
-

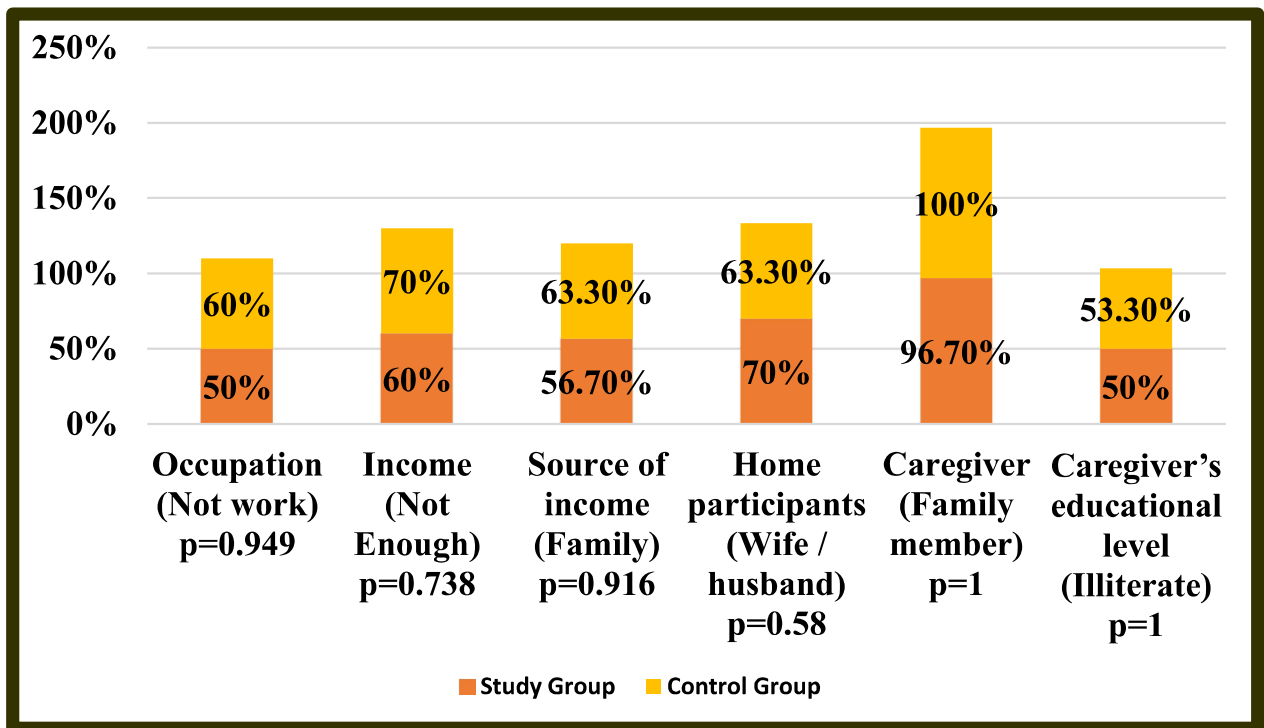
judged at the 5% level. - Cronbach's alpha reliability test was used to measure the reliability of all tools. Its maximum value is ( $\alpha=1.0$ ) and the minimum accepted value is ( $\alpha= 0.7$ ); below this level the tool would be unreliable

- Chi-square test was used for categorical variables to compare between different groups. Monte Carlo correction or Fisher's Exact was used for correction of chi-square when more than 20% of the cells have expected count less than 5. Student t-test was used for normally distributed quantitative variables, to compare between two studied groups

## 6. Results:



**Graph (1):** Distribution of patients in both study and control groups according to their socio-demographic characteristics (n=60).



**Graph (1) cont.: Distribution of patients in both study and control groups according to their socio-demographic characteristics (n=60).**

**Graph (1), shows the distribution of patients in both study and control groups according to their socio-demographic characteristics.** It was found that, more than half of patients were aged from 50 years to less than 60 years (53.3% & 50%) respectively of patients in the study and control groups, and more than half of patients in the study and control groups were male (66.7% & 60%) respectively. Around more than half of patients in the study and control groups were living in rural areas (56.7% & 60%) consecutively. Most of patients in the study and control groups were married (70% & 63.3%) consecutively, and 30% of patients in the study group and 20% of them in the control group had primary education. In addition, half of the study group 50% and more than half of the control group 60% didn't work. Also, 60% of patients in the study groups and 70% of them in the control groups considered their income not enough for their daily needs. More than half of patients in the study and control groups were dependent on their

family as a source of income (56.7% & 63.3%) respectively. In relation to home participants, it was found that, more than two third 70% of patients in the study groups and more than half of patients in the control group 63.3%, were living with their wives and husbands. In addition, the majority of patients in the study groups 96.7% and all patients 100% in the control groups had caregivers at home. Moreover, half of patients' care giver in both study and control group were illiterate (50% & 53%) comparatively. No statistical significant differences were found between the study and control groups as regards to socio-demographic data.

**Table (1): Comparison between the study and control groups according to adherence with pacemaker care practices(n=60).**

Pacemaker Care Practices	Study group (n = 30)				Control group (n = 30)				$\chi^2$	p
	Not performed		Performed		Not performed		Performed			
	No.	%	No.	%	No.	%	No.	%		
Monitoring pulse rate daily	17	56.7	13	43.3	25	83.3	5	16.7	5.079*	0.024*
Avoiding pressure over pacemaker site.	3	10.0	27	90.0	24	80.0	6	20.0	29.697*	<0.001**
Keeping pacemaker site dry and clean.	1	3.3	29	96.7	17	56.7	13	43.3	20.317*	<0.001**
Checking the wound for signs of infection	5	16.7	25	83.3	18	60.0	12	40.0	11.915*	0.001**
Keeping phone opposite of pacemaker.	18	60.0	12	40.0	27	90.0	3	10.0	7.200*	0.007*
Wearing loose cotton clothes.	3	10.0	27	90.0	13	43.3	17	56.7	8.523*	0.004*

<b>Avoid lifting arm above shoulder level.</b>	7	23.3	<b>23</b>	<b>76.7</b>	<b>24</b>	<b>80.0</b>	6	20.0	19.288*	<b>&lt;0.001*</b>
<b>Performing light exercises.</b>	4	13.3	<b>26</b>	<b>86.7</b>	<b>23</b>	<b>76.7</b>	7	23.3	24.310*	<b>&lt;0.001**</b>
<b>Performing shoulder exercises.</b>	9	30.0	<b>21</b>	<b>70.0</b>	<b>23</b>	<b>76.7</b>	7	23.3	13.125*	<b>&lt;0.001**</b>
<b>Performing follow up visits as advised.</b>	1	3.3	<b>29</b>	<b>96.7</b>	10	33.3	<b>20</b>	<b>66.7</b>	9.017*	<b>0.003*</b>
<b>Always carrying pacemaker card.</b>	9	30.0	<b>21</b>	<b>70.0</b>	<b>25</b>	<b>83.3</b>	5	16.7	17.376*	<b>&lt;0.001**</b>
<b>Notify the doctor for abnormal signs.</b>	2	6.7	<b>28</b>	<b>93.3</b>	9	30.0	<b>21</b>	<b>70.0</b>	5.455*	<b>0.020*</b>
<b>Eating healthy diet</b>	9	30.0	<b>21</b>	<b>70.0</b>	<b>25</b>	<b>83.3</b>	5	16.7	17.376*	<b>&lt;0.001**</b>
<b>Avoid lifting heavy weights by pacemaker implanted side arm.</b>	9	30.0	<b>21</b>	<b>70.0</b>	<b>19</b>	<b>63.3</b>	11	36.7	6.696*	<b>0.010*</b>
<b>Staying away from electromagnetic interference (EMI).</b>	5	16.7	<b>25</b>	<b>83.3</b>	<b>19</b>	<b>63.3</b>	11	36.7	13.611*	<b>&lt;0.001**</b>

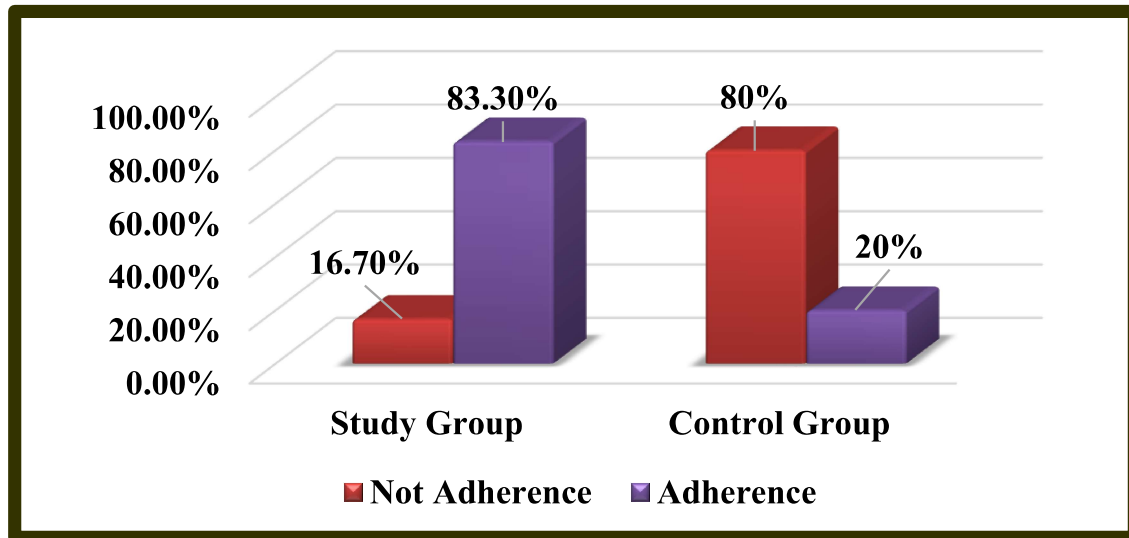
$\chi^2$ : Chi square test

\*: Statistically significant at  $p \leq 0.05$

\*\* : Highly statistically significant at  $p \leq 0.001$

Table (1), shows comparison between the study and control groups according to their adherence with pacemaker care practices. There were statistical significant differences between the groups in relation to adherence with pacemaker care practices after application of health education nursing intervention,  $p \leq 0.05$ . The majority of patients in the study group were adherent and performed certain items of pacemaker care practices as (wearing loose cotton clothes, avoid lifting arm above shoulder level, performing light

exercises, performing shoulder exercises, performing follow up visits as advised, carrying pacemaker card, notify the doctor for abnormal signs, eating healthy diet, avoid lifting heavy weights by pacemaker implanted side arm and staying away from Electromagnetic interference after application of health education nursing intervention. The graph also revealed that more than half (56.7% & 60%) respectively of patients in the study group were not monitoring pulse rate daily and were not keeping their phone opposite of pacemaker,  $p \leq 0.05$ .



**Graph (2): Comparison between the study and control groups according to total scores of adherences with pacemaker care practices (n=60).**

**Graph (2), presents comparison between the study and control groups according to total scores of adherence with pacemaker care practices.** It was noticed that 83.3% of the study group were adherent with pacemaker care practices as (wearing loose cotton clothes, avoid lifting arm above shoulder level, performing light exercises, performing shoulder exercises, performing follow up visits as advised, carrying pacemaker card, notify the doctor for abnormal signs, eating healthy diet, avoid lifting heavy weights by pacemaker implanted side arm and staying away from Electromagnetic Interference (EMI) after application of health education nursing intervention as compared to 20% only of the control

group. There was highly statistical significant difference between the study and control groups in relation to adherence with pacemaker care practices ( $p < 0.001$ ).

**Table (2): Comparison between the study and control groups according to daily activities items (n=60).**

Daily Activities items	Study group (n = 30)						Control group (n = 30)						$\chi^2$	p
	Dependent		Needs some assistance		Independent		Dependent		Needs some assistance		Independent			
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%		
<b>Shopping</b>	2	6.7	18	60.0	10	33.3	10	33.3	12	40.0	8	26.7	6.756*	0.034*
<b>Bathing</b>	2	6.7	8	26.6	20	66.7	7	23.3	11	36.7	12	40.0	5.104	<sup>MC</sup> p=0.077
<b>Dressing</b>	2	6.7	21	70.0	7	23.3	5	16.7	14	46.7	11	36.6	3.468	<sup>MC</sup> p=0.203
<b>Toileting</b>	0	0.0	5	16.7	25	83.3	0	0.0	10	33.3	20	66.7	2.222	0.136
<b>Mode of transportation</b>	1	3.3	5	16.7	24	80.0	0	0.0	15	50.0	15	50.0	7.962*	<sup>MC</sup> p=0.014*
<b>Transferring &amp; walking</b>	2	6.7	4	13.3	24	80.0	0	0.0	14	46.7	16	53.3	8.762*	<sup>MC</sup> p=0.006*
<b>Climbing stairs</b>	2	6.7	4	13.3	24	80.0	2	6.6	14	46.7	14	46.7	8.280*	<sup>MC</sup> p=0.008*
<b>Feeding</b>	1	3.4	4	13.3	25	83.3	0	0.0	9	30.0	21	70.0	3.139	<sup>MC</sup> p=0.212
<b>Grooming</b>	0	0.0	15	50.0	15	50.0	3	10.0	15	50.0	12	40.0	2.957	<sup>MC</sup> p=0.277

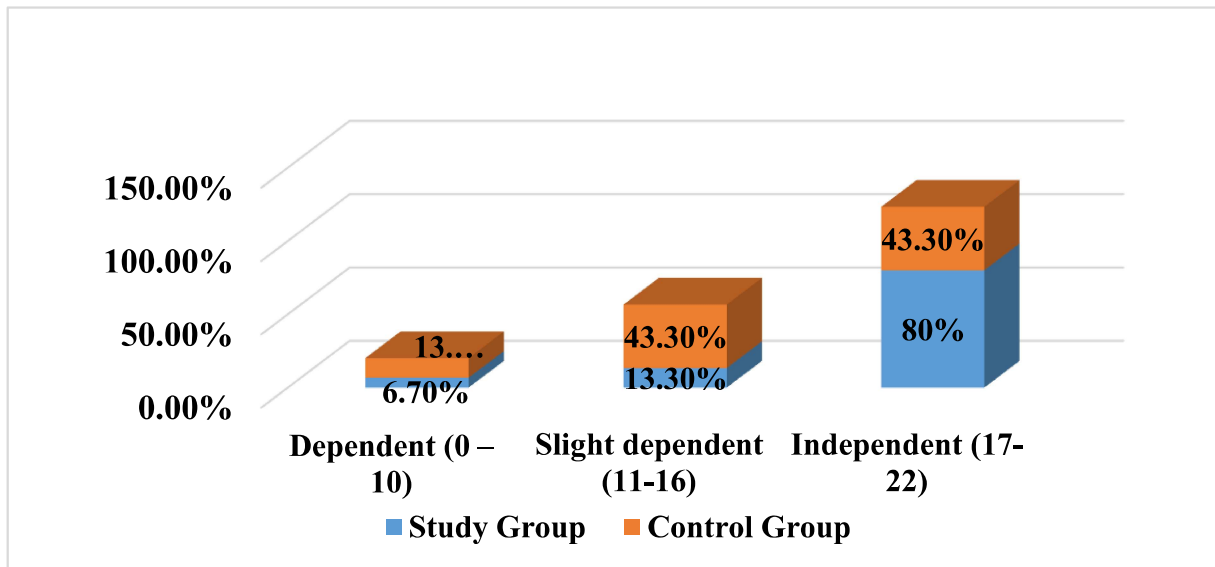


<b>Ability to use telephone</b>	1	3.4	4	13.3	<b>25</b>	<b>83.3</b>	0	0.0	8	26.7	<b>22</b>	<b>73.3</b>	2.415	<sup>MC</sup> p=0.330
<b>Responsibility for own medications</b>	2	6.6	8	26.7	<b>20</b>	<b>66.7</b>	2	6.7	13	43.3	<b>15</b>	<b>50.0</b>	1.996	<sup>MC</sup> p=0.418

$\chi^2$ : Chi square test      MC: Monte Carlo

\*: Statistically significant at  $p \leq 0.05$

**Table (2), illustrates comparison between the study and control groups according to daily activities items.** The table revealed significant differences between patients in the study and control groups in relation to performing daily activities as shopping, mode of transportation, transferring& walking and climbing stairs where p value = (0.034, 0.014, 0.006, and 0.008) respectively. More than three quarters 80% of patients in the study group were independent in mode of transportation, transferring& walking and climbing stairs, while more than half of them 60% were needing some assistance in shopping.



**Graph (3): Comparison between the study and control groups according to levels and score of daily activities(n=60).**

**Graph (3), shows the comparison between the study and control groups according to levels and score of daily activities.** The graph revealed that 80% of patients in the study group were independent in their daily activities, while 43.3% of patients in the control group were slightly dependent and independent in performing their daily activities. There were statistical significant differences between mean scores of the control and study groups in relation to their daily activities  $p= (0.048)$ .

## **7. Discussion:**

Pacemaker safe care practices and long-term follow-up are necessary not only for safety of pacemaker patient but also for the adequate use of the pacing system. Patients must know the detailed restrictions and precautions in ADL after pacemaker insertion. So, teaching patients the essential points regarding to pacemaker management, can prevent many of complications (**Olson 2014& Mulpuru2017**).

The results of the current study revealed that, in relation to patients' age, the most common age was 50 years to less than 60 years in patients in the study and control groups. It could be due to the physiological changes that happen with age which may increase a person's risk of heart diseases. This finding agrees with **(North and Sinclair 2012&Chiao, Lakatta, Ungvari, Dai, Rabinovitch, 2016; North , Sinclair, 2012)**, who found that aging has a remarkable effect on the heart and arterial system, leading to an increase in cardiovascular diseases (CVD) including atherosclerosis, hypertension, myocardial infarction, and stroke.

Regarding sex, the findings showed that more than half of patients in the study and control groups were male. It can be explained that men usually engage in risk-taking activities that can seriously threaten their well-being and life and also are reluctant than women to seek medical help when they are ill **(Peate, 2007)**. Consistent with the current results of **(Gao et al,2019)** who found that cardiac diseases are higher in men than in women due to excessive alcohol consumption and smoking among men. They elaborated that coping with stressful events may be less adaptive physiologically, behaviorally, and emotionally, contributing to their increased risk for cardiac diseases.

In addition, the current study results showed that, most patients in the study and control groups were married. This result was in the same line with **(Gillis ,2018& Dhindsa et al, 2020)** reported that married patients are more likely to survive and to follow their cardiac diseases than single, widowed and divorced patients. Furthermore, **(Mohamed et al, 2016)** reported that the married people were liable to cardiac diseases more than single because they always facing psychological stress of the social role and responsibility about the family.

Concerning level of education, the results revealed that more than one quarter of patients in the study group had basic education and one third of control group were illiterate. This could be due to the low social standard for patients go to the new Main University Hospital. This results are in accordance with **(Dégano et al, 2017)** who found an inverse

---

association between education and CVD incidence. They attributed this to the widespread prevalence of smoking and unhealthy habits among lower educated patients.

As regards occupation, the present study revealed that half of the study group and more than half of the control group did not work. This may be attributed to the negative impact of cardiac disease in patient's ability to work. In this respect, **(Zagożdżon 2014)** reported that cardiac diseases were significantly associated with unemployment among patients.

The current study results illustrated that, more than half of patients in the study and control groups considered their income as not enough. Moreover, most of patients were living in rural area. Consistent with the current results of **(Mohamed et al, 2016)**, who pointed that the majority of the patients with pacemakers under study had inadequate monthly income for treatment costs and the majority of them complained from high cost of transportation and medications.

Implantation of the permanent cardiac pacemaker device is only the initial step in the lifelong management of the patient with a pacemaker and adherence to care practices regarding pacemaker is vital not only for the safety of the patient but also the key to optimal utilization of the pacing system **(Peate,2007)** .The current study results revealed a statistical significant difference between the control and study groups regarding adherence with pacemaker care practices after application of health education nursing intervention. Patients in the study group were adherent to all items of care practices except for monitoring pulse rate daily and keeping phone opposite of pacemaker.

Moreover, the study results showed that more than three quarters of the study group were adherent with pacemaker care practices compared to nearly one quarter only of the control group. It could be due to continuous demonstration, redemonstration during the sessions, and the illustrated instructional booklet with pictures during health education nursing interventions provided to the study group after insertion of permanent pacemaker. This finding was supported by **(Sharma et al, 2018)**, who found significant improvement of patient's performance and care practices after education program and

---

follow up. Moreover, **(El-aal HYE A ,2017)**, found that there was statistically significant difference in studied sample practices between pre and post program related to pacemaker incision care, pulse, avoiding tight clothes, and wearing medic bracelet.

As regards monitoring pulse rate daily and keeping phone opposite of pacemaker, the results of the current study showed that more than half of patients in the study group were not adherent to these practices after giving health education. This might be attributed to the fact that less than half of them were either illiterate, read and write or had basic education. So, they cannot read or seek information effectively about these aspects of pacemaker. This is consistent with the results of **(Elsayed ,2013)**, who found that most of the study sample were not adherent to pacemaker care practices and never measuring pulse daily.

The results of the current study illustrated insignificant differences between patients in study and control groups in relation to items of daily activities except in items of shopping, mode of transportation, transferring & walking and climbing stairs. More than three quarters of patients in the study group were independent during transferring & walking and climbing stairs and in total score of daily activities. This may be attributed to the fact that pacemaker restores normal heart rates and relieves symptoms of a slow, irregular heart rhythm and hence the general cardiovascular state of the patient and their abilities to do activities of daily living. Moreover, it may be attributed also to the improvement in skills regarding doing activities of daily living as a result of the knowledge acquired through health education nursing intervention.

This result is in concordance with the result of **(Sharma et al,2018)**, who found highly statistically significant improvement in independence of performance of activities of daily living like feeding, bathing, grooming, mobility, transfer, toilet use, stair use among experimental group after 2 months of pacemaker implantation.

From the ongoing discussion, it can be concluded that, the health education nursing intervention for patients with permanent pacemaker is essential and fundamental

---

for adherence to care practices and daily activities. Furthermore, the health education nursing intervention has a positive effect on the patient life by enhancing self-care abilities, improving outcome and decreasing unnecessary hospitalization.

## **8. Conclusion**

Based on the findings of the results of this study, it can be concluded that adherence with pacemaker care practices was improved significantly in the study group patients more than those of the control group after application of health education nursing intervention. Furthermore, independency in daily activities was improved significantly in the study group patients more than those of the control group after application of health education nursing intervention.

## **9. Recommendations**

Based on the findings of the present study, the following recommendations should be considered.

- Developed booklet should be available and distributed to all patients undergoing permanent pacemaker insertion in the study setting, outpatient clinics and other cardiology departments.
- Improving awareness of patients' caregivers is necessary regarding pacemaker practices, precautions and how to deal with pacemakers' complications.
- Developing in-service training program for nurses working with patients undergoing permanent pacemaker insertion regarding correct practices and activities after pacemaker insertion should be encouraged.

---

## 10. References

---

- Al-Ahmad, A., Natale, A., Wang, P. J., Daubert, J. P., & Padeletti, L. (2018). *How-to Manual for Pacemaker and ICD Devices*: Wiley Online Library.
- Ali, N. S., Youssef, W., Mohamed, A., & Hussein, A. (2015). Nurses' knowledge and practice regarding implantable cardiac devices in Egypt. *British Journal of Cardiac Nursing*, 10(1), 34-40.
- Amara, W., Cheggour, S., Salih, H., Elhraiech, A., Taieb, J., Glerici, G., . . . Gacem, K. (2013). Pacemakers patients perception of daily life activities and follow-up: a French survey. *European Heart Journal*, 34(suppl\_1).
- Amara W, C. S., Salih H, Elhraiech A, Taieb J, Glerici G, et al. (2013). Pacemakers patients perception of daily life activities and follow-up: a French survey. *European Heart Journal*, 34.
- Aqeel, M., Shafquat, A., & Salahuddin, N. (2008). Pacemaker patients' perception of unsafe activities: a survey. *BMC Cardiovascular Disorders*, 8(1), 31.
- Barold, S. S., Stroobandt, R. X., & Sinnaeve, A. F. (2010). *Cardiac pacemakers and resynchronization step by step: An illustrated guide*: John Wiley & Sons.
- Brunner, L. S. (2017). *Brunner & Suddarth's textbook of medical-surgical nursing* (14th ed. Vol. 1): Lippincott Williams & Wilkins.
- Carrión-Camacho, M., Marín-León, I., Molina-Doñoro, J. M., & González-López, J. R. (2019). Safety of permanent pacemaker implantation: a prospective study. *Journal of Clinical Medicine*, 8(1), 35.
- Chiao, Y. A., Lakatta, E., Ungvari, Z., Dai, D.-F., & Rabinovitch, P. (2016). Cardiovascular disease and aging *Advances in Geroscience* (pp. 121-160): Springer.
- Dhindsa, D. S., Khambhati, J., Schultz, W. M., Tahhan, A. S., & Quyyumi, A. A. (2020). Marital status and outcomes in patients with cardiovascular disease. *Trends in cardiovascular medicine*, 30(4), 215-220.
- Elsayed, R. (2013). factor effecting complianceof patients with permanent pacemaker regarding threputic regimen. faculty of nursing. Ain shams university.
- Gillis, M. (2018). Married heart patients more likely than singles to survive.
- Knapp, R. (2020). *Hemodynamic Monitoring Made Incredibly Visual!* : Lippincott Williams & Wilkins.
- Kotsakou, M., Kioumis, I., Lazaridis, G., Pitsiou, G., Lampaki, S., Papaiwannou, A., . . . Karapantzos, I. (2015). Pacemaker insertion. *Annals of translational medicine*, 3(3).
-

- Kurucová, R., Žiaková, K., Gurková, E., & Šimková, E. (2014). Quality of life of patients with a permanent pacemaker. *Central European Journal of Nursing and Midwifery*, 5(1), 15-20.
- Mulpuru, S. K., Madhavan, M., McLeod, C. J., Cha, Y.-M., & Friedman, P. A. (2017). Cardiac pacemakers: function, troubleshooting, and management: part 1 of a 2-part series. *Journal of the American College of Cardiology*, 69(2), 189-210.
- North, B. J., & Sinclair, D. A. (2012). The intersection between aging and cardiovascular disease. *Circulation research*, 110(8), 1097-1108.
- Olshansky, B., & Hayes, D. (2016). *Patient education: Pacemakers (Beyond the Basics)*. Up to Date.
- Olson, K. (2014). *Oxford handbook of cardiac nursing*: Oxford University Press.
- Peate, I. (2007). *Men's health: The practice nurse's handbook (Vol. 15)*: John Wiley & Sons.
- Schmitto JD, D. E., Rojas SV, Maltais S, Khalpey Z, Hanke JS, et al. (2016). Minimally invasive implantation: The procedure of choice! *Operative Techniques in Thoracic and Cardiovascular Surgery*. 21(1), 65-78.
- Sharma K, S., Singh N and Sharma Y. (2018). Assessment of effectiveness of permanent pacemaker care guidelines on patient activity and adherence. *International journal of advanced research*, 6(9), 489-501.
- Sharma K, S., Singh N and Sharma Y (2018). Assessment of Effectiveness of Permanent Pacemaker Care Guidelines on Patient Activity and Adherence. *International journal of Advanced Research*, 6(9), 489-501.
- Tarun, D., & Bashar, A. (2019). *Pacemaker Indications StatPearls [Internet]*: StatPearls Publishing.
- Timperley, J., Leeson, P., Mitchell, A. R., & Betts, T. (2019). *Pacemakers and ICDs*: Oxford University Press.



## الملخص العربي

### تقييم تأثير التدخل التمريضي للتثقيف الصحي على إلتزام مرضى منظم ضربات القلب الدائم لممارسات الرعاية والأنشطة اليومية .

المقدمة: ممارسات الرعاية الآمنة لجهاز تنظيم ضربات القلب والمتابعة طويلة المدى ضرورية ليس فقط لسلامة مريض جهاز تنظيم ضربات القلب ولكن أيضاً للاستخدام المناسب لنظام تنظيم ضربات القلب. و لذلك يجب أن يعرف المرضى القيود والاحتياطات بالتفصيل في النشاط اليومي بعد إدخال جهاز تنظيم ضربات القلب لمنع العديد من المضاعفات.

الهدف من الدراسة: تقييم تأثير التدخل التمريضي للتثقيف الصحي على التزم مرضى منظم ضربات القلب الدائم لممارسات الرعاية والأنشطة اليومية.

إفتراضات البحث: مرضى منظم ضربات القلب الدائم والذين يتلقون تدخلاً تمريضياً للتثقيف الصحي سيظهرون متوسط درجات أعلى في الإلتزام بممارسات الرعاية ، وفي الأنشطة اليومية من أولئك الذين يتلقون الرعاية الروتينية لجهاز تنظيم ضربات القلب.

منهجية البحث: تم استخدام تصميم بحثي شبه تجريبي لإجراء هذه الدراسة على 60 مريضاً يخضعون لجهاز تنظيم ضربات القلب الدائم في وحدة القلب والكهرباء في المستشفى الجامعي الرئيسي الجديد.

تم إستخدام ثلاث أدوات لتجميع البيانات من المرضى:

الأداة الأولى: استمارة المقابلة الشخصية الخاصة بالبيانات الاجتماعية والديموجرافية والإكلينيكية للمريض.

الأداة الثانية: أداة الإلتزام بممارسات رعاية منظم ضربات القلب.

الأداة الثالثة: أداة الأنشطة اليومية.

النتائج: لقد أسفرت نتائج البحث عن الأتي : وجود فروق ذات دلالة إحصائية بين المجموعتين فيما يتعلق بالإلتزام بممارسات العناية بجهاز تنظيم ضربات القلب وأداء بعض الأنشطة اليومية. علاوة على ذلك ، كان غالبية المرضى في مجموعة الدراسة مستقلين في أنشطتهم اليومية عن أولئك في المجموعة الضابطة بعد تطبيق التدخل التمريضي للتثقيف الصحي.

الخلاصة: كان الإلتزام بممارسات رعاية جهاز تنظيم ضربات القلب والاستقلالية في الأنشطة اليومية أفضل بين مرضى مجموعة الدراسة من مرضى المجموعة الضابطة بعد تطبيق التدخل التمريضي للتثقيف الصحي.

التوصيات: الحث على تدريب الممرضات العاملات مع المرضى الذين يخضعون لإدخال منظم ضربات القلب بشكل دائم أثناء الخدمة التمريضيه لهم و ذلك فيما يتعلق بالممارسات والأنشطة الصحيحة.