Self-care of Adult Client with Permanent Pacemaker at Home

Nawal Mahmoud Soliman *, Hemat Abd Elmoneem ElSayied, Naglaa Abd El Kareem Hassaneen Soliman*****
Professor of Community Health Nursing*, Professor of Community Health Nursing**, M.Sc.N., Community Health Nursing***
Faculty of Nursing- Ain Shams University-Cairo-Egypt.

Abstract

Background: Sudden death is one of the most common reasons of death worldwide which can be prevented by inserting a pacemaker. Studies have proved that 60 percent of all sudden cardiac deaths occur due to arrhythmia**. Aim:** To assess self-care for adults clients with permanent pacemaker at home. **Design:** Descriptive analytic design was used. **Setting:** In cardiac outpatient clinics at El-Demardash Hospital. **Sample**: It included the total sample size was 74 adult client with apermanent pacemaker were chosen according certain criteria age over 40 years and recent implantation of pacemaker not more than 2years ago. **Tool:** An interviewing questionnaire designed to collect data about studied sample socio demographic characteristics, and their knowledge about heart, pulse, permenant pacemakers and self-reported practices about pacemaker care at home. **Results**: Majority of studied sample were their aged 60 or more years, Majority of them were married, illiterate& most of them had incorrect knowledge regarding heart, pulse, artificial permenant pacemakers and unsatisfied total practices score, There were a no statistical significant relation between client's age, level of education & occupation and their total knowledge &self -care of adults clients with permanent pacemaker. Occupation and their total knowledge of adult clients and their self- care, the permanent pacemaker effect on self-care of the adults clients with a permanent pacemaker at home. **Conclusion:** Study finding showed that the majority of clients hadn't a correct knowledge & poor self-care regarding permanent pacemaker at home. **Recommendation:** Establish educational program for adult clients with a permanent pacemaker at home to improve their self-care regarding their knowledge and practice of permanent pacemaker at home. A further research on a large sample is recommended to achieve more generalization.

Keywords: Pacemaker, self- care, & adults clients.

Introduction

The heart is a fist-sized, muscular organ situated in the center of the chest behind the sternum which pumps blood through the blood vessels by repeated, rhythmic contraction. The term cardiac (as in cardiology) means "related to the heart and vertebrate heart is principally composed of cardiac muscle and connective tissue. Cardiac muscle is an involuntary striated muscle tissue founded only in this organ and responsible for the ability of the heart pump blood. The average human heart, beating at 72 beats per minute **(Sundjaja et al., 2020).**

Nature pacemaker: Sinoatrial node acts as the natural pacemaker of the heart. The cells present in the sinus node have innate automaticity, which starts the electrical activity in the heart. This innate electrical potential moves from the sinoatrial node to the atrioventricular node and finally into the His-Purkinje system **(Muhammad, 2020).**

Self-care as the ability of individuals, families and communities to promote health, prevent disease, maintain health, and to cope with illness. It is abroad concept which also encompasses hygiene (general and personal); nutrition (type and quality of food eaten); lifestyle (sporting activities, leisure, etc.) **(WHO, 2021)**

Patients and family members must know about pacemaker's programmed lower and upper heart rate. Pulse rate should be checked daily. Patients should allow about eight weeks for pacemaker to settle firmly in place, during this period avoid sudden movements of the affected arm and for the first

4 weeks not raise the pacemaker side elbow higher than shoulder. Avoid causing pressure over implanted pacemaker. However after surgery, patient will be able to perform all normal activities for a person of same age. Always carry pacemaker card with patient. Stay away from electromagnetic interference and patient must be aware of warning signs like dizziness, dyspnea, irregular pulse rate, edema **(American Heart Association, 2017).**

Significance of the study

Sudden death is one of the most common reasons of death worldwide which can be prevented by inserting a pacemaker. Studies have proved that 60 percent of all sudden cardiac deaths occur due to arrhythmia." Each year 1-2 million persons worldwide die because of lack of access to pacemakers **(Bhamri, 2017).**

Aim of the study

The aim of this study is to assess self-care for adults clients with permanent pacemaker at home through:

1- Assessing of knowledge adult client with a permanent pacemaker at home regarding a anatomy, physiology of the heart &a permanent pacemaker.
2- Assessing practice of adult client with a permanent pacemaker at home about their self-care practices regarding a permanent pacemaker

Research Questions:

1- Are the adults clients with apermenant pacemaker having knowledge about the permanent pacemaker at home?
2- What are home self-care practices of adult clients with permanent anent pacemaker?

Subject & Methodology

I-Technical design
II-Administrative and ethical design
III- Operational design
IV-Statistical design

I-Technical Design:

The technical design for the study included research design, the setting of the study subject, sample and tools for data collection.

A-Research design:

Descriptive research design was utilized to fulfill the aim of this study.

B- Setting:

The study was conducted at outpatient clinics at Ain Shams University (El-Demerdash Hospitals) Cairo Governorate, the place consist of one large halls, contains of three rooms, one for the consultant well equipped with the latest diagnostic device examiner room, the second room for pacemaker insertion the third room for post insertion follow-up and the fourth room is for waiting to follow up after post insertion and well ventilation and illuminated perception with comfortable chairs it suitable for session and two clean and illuminated bathroom.

C- Sampling:

A purposive sample was used in this study. The total number of client with a permanent pacemaker admitted 2016 at the Ain Shams El-Demardash Hospital were 25% (84) adult client with a permanent pacemaker 336 (7 adult client /week). 25% was chosen according previous criteria and pilot study it was chosen and carried out on 10 adult client with permanent pacemaker whom & excluded later the study sample. The sample was became 74 adult client with a permanent pacemaker for both genders (male &female), adult client with permanent pacemaker above 40 years old –recent insertion after 2 years and accepting to participate in the study.

D-Tools of data collection:

Data was collected by using the following tool:

First tool: An interviewing questionnaire that was developed by the researchers in Arabic language after reviewing of related literature **(Mulpuru, 2017), (UW. Health, 2017), (Ahmed A., 2015), & (Fuster, 2011)** a**:** it comprised two parts:

- **Part One:** adult client's Socio- Demographic characteristics Data: it included age, gender, marital status, level of education& job.

- **Part two:**

a-Assess of adult client with a permanent pacemaker at home about their knowledge regarded to cardiovascular system (heart, natural pacemaker.

b-Assess of adults clients with a permanent pacemaker at home about their self-care regarded to a permanent pacemaker.

❖ **Scoring systems** of knowledge tool: The knowledge tool was coded. 1 score for the correct answer, zero score for incorrect and 0 for don't know answer the total knowledge scores were considered satisfactory if the score of the total knowledge ≥75% and considered unsatisfactory if it is less than 75%.

Second Tool (Kats Index of Independency in Activity of Daily Living): To assess the adult client with a permanent pacemaker at home about their practice regarded to their daily living.

❖ **Scoring systems of self-care tool:** The tool was coded. 2 score for frequently,1 score sometime answer, 0 score for never, and The total knowledge scores were considered adequate if the score of the total knowledge ≥ 60 % and considered inadequate if it is less than 60%.

Self-care about their modification of their dealing with their home environment devices and their self care about their about their general precaution about the permanent pacemaker implementation.

II- Administration Design:

An official approval letter was taken from the faculty of Nursing –Ain Shams University to the general manager of previously mentioned setting to facilitate in conducting the study.

Ethical Consideration:

The subject rights will be secured. Nature of the study will be harmless the adult client with a permanent pacemaker at home was right to accept or refuse participation at any time. Ensure that privacy and confidentiality of all records and personal information will be used only for research purpose.

III-Operational Design:

A- Preparatory phase:

A review of past and recent, current, national and international related literatures covering all aspects of the researcher subject using the available textbooks, nursing articles and magazines and internet search. In order to get a clear picture on the research problem and to assist in development of data collection tools to gather all information and review about knowledge and self-care of adults clients with a permanent pacemaker at home

B- Pilot Study:

It was carried out on 10% of a adult client with a permanent pacemaker at home to test applicability of the tools then the necessary modifications was done according to the result of pilot study and carried out on whom are included later in the study simple.

C-Field Work:

- The researcher revised the literature to design the tools and the tools will revise from expertise to test the content validity.
- Approval was obtained from the concerned authorities in the faculty of nursing.
- Written consent was obtained from every adult client with a permanent pacemaker at home to share in the study.

The actual field work started from the beginning of July and finished at **December (2019)** for data collection. The investigator was available one day weekly (Thursday) during morning shift from 9am to 1 pm, and started by introducing herself to the clients and giving the brief idea about the aim of the research. and verbal consent was obtained from adult client with permanent pacemaker to share in the study the researcher interviewed with each adult client with permanent t pacemaker individually at available time within 30 minute to complete questioner. This technique was performed one day each week.

Before starting the follow up and taking permission for conducting this study, formal letter was issued from the Faculty of Nursing, Ain Shams University to the directors of hospitals selected for the study describing the aim of study.

IV-Statistical design

The obtained finding will be analyzed by appropriate statistical Methods and tests of significance and then will be presented in tables**;** the collected data were organized, categorized, tabulated, and analyzed. Data were presented in tables and charts using SPSS (the Statistical package for Social Science for windows) version 20.0 the statistical significance and associations were assessed using percentage values (%), mean value, and standard deviation (SD), and P- value.

Significance of Result:

- Non – significant (NS) if P>0.05
- Significant (S) if P<0.05
- Highly significant (HS) if P<0.01
- Number (N)

Result

Table (1): shows that the age of the studies clients with permanent pacemaker were 29.0% between 50-60 years, the genders 59.5% were males, 85.1% of them were married while 45.9% of them were illiterates. Regarded to Type of occupation 62.2% of them was hard work, while 59.5% of them were smoker.

Figure (1): frequency distribution for adults clients with permanent pacemaker at home regarding their knowledge about anatomy and physiology of heart

Table (2): indicates that 6.8%, 2.7%, & 2.7% of adults clients with permanent pacemaker had a correct knowledge regarding to Meaning of permanent pacemaker device, Types of permanent pacemaker Signs of a permanent pacemaker malfunction respectively. Also 9.5%of them had a correct knowledge about the permanent pacemaker signs and symptoms complication about a permanent pacemaker.

Table (3): indicates that (31.1 %,. 20.3 %& 21.6%)of adult client with a permanent pacemaker done their self- car with always about Housing activities, Take a shower & Take a get dressed Without help from others.

Table (4): indicate that (0.0%, 0.0% & 10.8%) respectively of adults clients with permanent pacemaker had self-care regarded to important of follow up toward The most important people to tell you that you have a permanent pacemaker, Important of know how to measure the pulse and The heart rate of artificial permanent pacemaker.

Table (5): shows that (5.4%, 5.4% &10.3%) of adult client with permanent pacemaker done always regarding to their self-care toward How to use the cellular. phone, Deal with security or anti-theft detectors (metal detectors) & Household appliances.

Table (6): illustrates that there was no statistically significant relation between studied sample regarded to their self-care and their age, marital status, living condition, level of education.

Table (1): Frequency distribution of the studied sample according to their socio-demographic characteristics (n=74).

Socio- demographic	No	%
Age		
40 -<50	20	27.0
50 -< 60	25	33.8s
60 and more -	29	839.2
Mean ±SD	45.32±12.24	
Gender		
Male	44	59.5
Female	30	40.5
Social status		
Single	3	4.1
Married	63	85.1
Widowed	6	8.1
Divorced	2	2.7
Educational level		
Illiterate	34	45.9
Basic education	22	29.7
Secondary education	16	21.6
High education	2	2.7
Occupation		
Employee	26	35.1
Worker	39	52.7
Farms	9	12.2
Type of Occupation		
Hard	46	62.2
Simple	28	37.8
Smoking		
Smoker	44	59.5
Non smoker	30	40.5

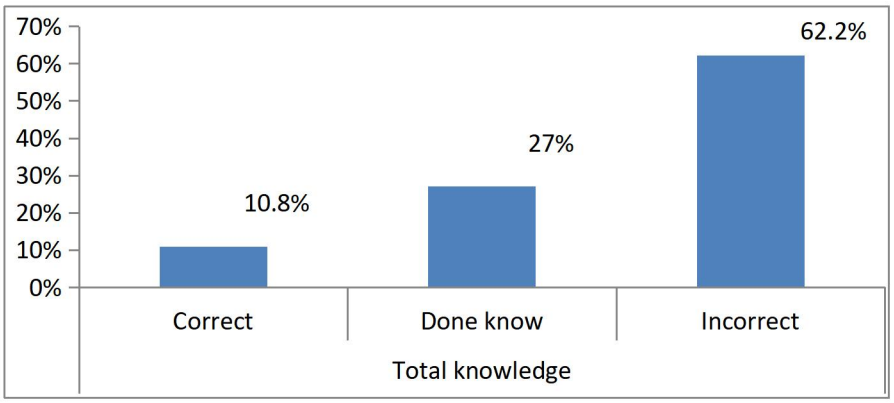

Figure (1): Frequency Distribution of studied sample as regards to their total knowledge.

Table (2): Frequency distribution for the adults clients with perm anent pacemaker at home regarding their knowledge toward a permanent peace maker (n=74).

Knowledge about permanent pacemaker implementation	Correct		Don't know		Incorrect	
	No	%	No	%	No	%
Meaning of permanent pacemaker device	5	6.8	25	33.8	44	59.5
Types of permanent pacemaker	2	2.7	28	37.8	44	59.5
Indication of permanent pacemaker device	9	12.2	21	28.4	44	59.5
Parts of the device	0	0.0	30	40.5	44	59.5
Signs of a permanent pacemaker malfunction	2	2.7	28	37.8	44	59.5
The follow-up time of the pacemaker device	17	23.0	0	0.0	57	77.0
The warning signs of pacemaker	12	16.2	51	68.9		14.9
The pacemaker insertion sites	17	23.0	30	40.5	27	36.5
The permanent pacemaker signs and symptoms complication	7	9.5	42	56.8	25	33.8

Table (3): Frequency distribution of the adults clients with a permanent pacemaker at home regarding their self-care regarded to a permanent pacemaker (n=74).

Practices related to of daily living activities	Always		Sometimes		Never	
	No	%	No	%	No	%
Do some physical activity	16	21.6	11	14.9	47	63.5
Carrying heavy objects	16	21.6	11	14.9	47	63.5
Participation in violent exercise	16	21.6	11	14.9	47	63.5
Housing activities	23	31.1	17	23.0	34	45.9
Take a shower	**15**	**20.3**	**17**	**23.0**	**42**	**56.8**
Take a get dressed Without help	16	**21.6**	12	**16.2**	46	**62.2**
taking medications	**3**	**4.1**	**43**	**58.1**	**28**	**37.8**
Walk for 15 minutes	23	**31.1**	20	**27.0**	31	**41.9**
Shopping	20	**27.0**	15	**20.3**	39	**52.7**
Staying in a certain position while sleeping	20	**27.0**	30	**40.5**	24	**32.4**
Driven car	36	**48.6**	18	**24.3**	20	**27.0**
Sitting front of television	38	**51.4**	16	**21.6**	20	**27.0**

Table (4): Frequency distribution for the adults clients with a permanent pacemaker at home regarding their self-care about Important of the follow up toward permanent pacemaker (n=74).

Important of the follow up	Always		Sometimes		Never	
the signs of inflammation the insertion site	10	13.5	58	78.4	6	8.1
Times of battery off	10	13.5	53	71.6	11	14.9
The heart rate of artificial permanent pacemaker	8	10.8	23	31.1	43	58.1
Avoid exposure to the risk places	8	10.8	26	35.1	40	54.1
Know the pacemaker Data (ID)	17	23.0	0	0.0	57	77.0
The most important people to tell you that you have a permanent pacemaker	0	0.0	59	79.7	15	20.3
Important of know how to measure the pulse	0	0.0	30	40.5	44	59.5

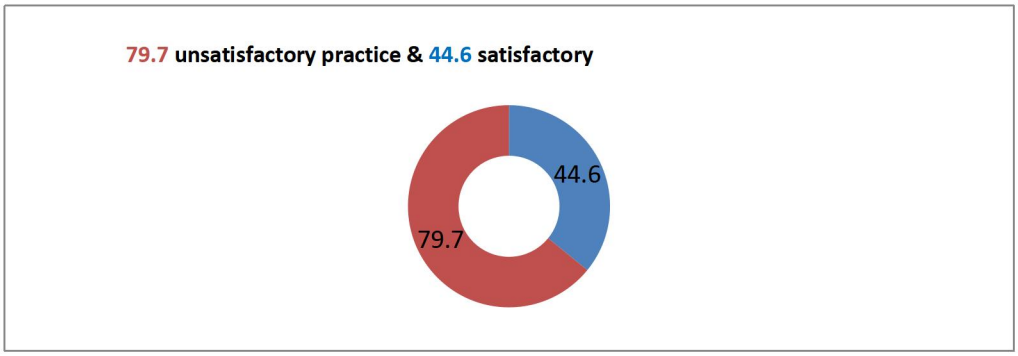

Figure (2): Differences of adult clients with a permanent pacemaker at home regarding their total practices pre and post educational program.

Table (5): Distribution of studied sample regarding their self-care about general precaution of a permanent pacemaker (n=74).

Items	Always No	Sometimes %	Never No	Always %	Sometimes No	Never %
What are the specifications for the clothes to worn	11	14.9	51	68.9	12	16.2
use the cellular phone	4	5.4	33	44.6	37	50.0
Deal with security or anti-theft detectors (metal detectors)?	4	5.4	59	79.7	11	14.9
Household appliances must be kept at least 12 inches apart	8	10.8	34	45.9	32	43.2

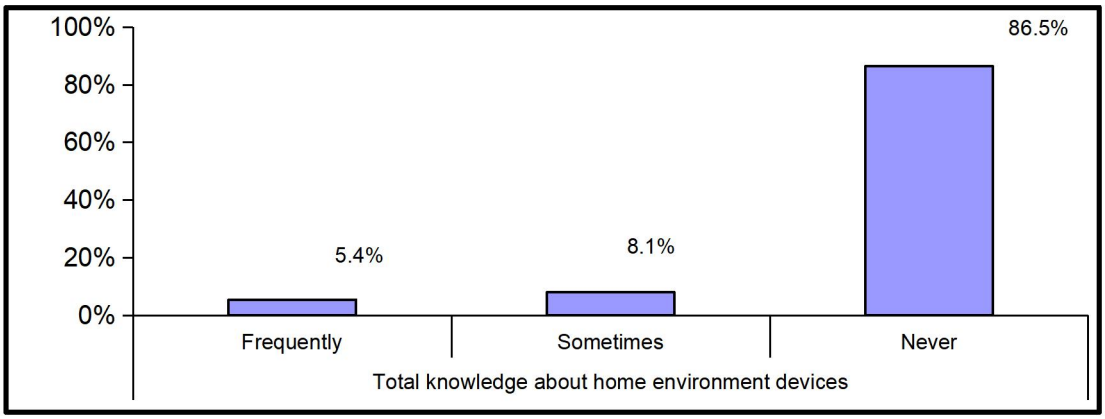

Figure (3): Frequency distribution for the adults clients with a permanent pacemaker at home regarding their self-care about dealing with their home environment devices at home (n=74).

Table (6): Statistically relation between sociodemographic and their self-care and the adults clients with a permanent pacemaker at home (n=74).

Items	Unsatisfactory (n=41)		Satisfactory (n=33)		X^2	p-value
	No	%	No	%		
Age						
40 -	13	31.7	7	21.2	5.75	0.056
50 -	19	46.3	10	30.3		
Over 60 -	9	22.0	16	48.5		
Gender						
Male	22	53.7	22	66.7	1.28	0.257
Female	19	46.3	11	33.3		
Social statues						
Single	1	2.4	2	6.1	2.56	0.464
Married	34	82.9	29	87.9		
Widowed	4	9.8	2	6.1		
Divorced	2	4.9	0	0.0		
Education level						
Illiterate	8	19.5	14	42.4	7.58	0.056
Basic	19	46.3	15	45.5		
Intermediate education	13	31.7	3	9.1		
High education	1	2.4	1	3.0		
Occupation						
Employee	17	41.5	9	27.3	2.86	0.239
Worker	21	51.2	18	54.5		
Farms	3	7.3	6	18.2		

Discussion

Sudden death is one of the most common causes of death in India & worldwide and it can be prevented by implanting a pacemaker (ICD). Studies have shown that 60 per cent of all Sudden Cardiac Arrest occur due to arrhythmia." Each year 1-2 million individuals worldwide die due to a lack of access to pacemakers. In India, about 1, 00,000 patients suffer from brad ycardia (slow heart rate) every year. However, only 20,000 patients resort to pacemakers in India annually. Need to take after having a pacemaker placed **(Bhamri, 2017).**

A permanent cardiac pacemaker is implantable device used to maintain sufficient heart rate when natural mechanisms fail, either as a result of a deficiency with the natural PM or the conduction system in the heart the impaired cardiac rhythm is initiated and maintained through cardiac pacing where very low electrical energies are delivered to the heart repetitively. Pacing may be temporary, with an external pulse generator, or permanent, with an implanted pulse generator.More recently, the indications for cardiac pacing have extended beyond symptomatic such as bradycardia **(Snegalatha et al., 2019)**.

As regards age, the present study indicated that, more than one third of studied sample aged 60 or more years (**table 1)** this result in the same line with **Sharma et al. (2018)** in India who studied Assessment of effectiveness of permanent pacemaker care guidelines on patient activity and adherence The total sample size were100 adults patients with permanent pacemaker from both gender who showed that more than the half of study subject was male 60%. This finding agreement with **Mohamed et al. (2015)** i8 n Egypt who studies Impact of Nursing Teaching Protocol on reduction of Complications for Patient with Permanent Artificial pacemaker who shows that majority 63.3% of study group patients

were between 61-80 years this finding an incongruent with, **Jesica & Kulkarin et al. (2019)** in India who studied that Program on Knowledge Regarding the Care of a Permanent Pacemaker at Home among Patients, he total sample size was 50 adult patients who revealed that of 64% the age group of 51years.This may be due to recurrent exposure to life stressors and responsibility the most of patients often utilized in older adults, this is due to an increase in abnormalities of impulse generation and conduction with advancing age.

In relation to gender, the present results showed that, that nearly two third of the studied sample were male. In the same line, **Abu-Salem et al. (2017)** lwho applied emotional and physical rehabilitation protocol on patients undergoing permanent cardiac pacemaker implantation, who revealed that more than one half of studied sample were male he total sample size was 60 adult patients &Purposive sampling who revealed that more than half of studied sample was male 56.0%. on the other hand this finding was an incongruent with **Nasr et al. (2016),** in Egypt who studied that, Impact of counseling program on Knowledge and self-efficacy of patients with implanted permanent A convenience sample of 35 adult patients from both genders who, revealed that more than half were females,. This may be due to recurrent males more than females' exposure to life stressors and responsibility.

Concerning marital status, the current study revealed that, Majority of study sample were married (**table1)** This finding agree with **Ahmed Abdul-Hussein et al. (2020**) in Iraq, Who studied the Effectiveness of an Instructional Programs on Patient's Knowledge Regarding Self- Care Management after Ischemic Heart Disease the studied sample size was 50 patients who mentioned that the, majority of studied sample were married.86.0% Also this findings on the same line, **Elsayed, (2013)** who found that, the majority of study sample were married in Egypt who studied Factor effecting compliance of patients with permanent pacemaker regarding therapeutic regimen. The total sample size was 70 adult patient with permanent pacemaker from both gender who showed that Majority of study subjects were married 72% in experimental group This may be due to that, the married people were liable to cardiac diseases more than single because they always Facing psychological stress of the social role.

In relation to education, the present results showed that, appromimtly half of the studied sample were illiterates this finding accordance with and **(Abd Elaziz, 2013)** who mention that the noticeable findings of the study was that, less than half of the patients under study were illiterate. This could be due to the low social standard for patients attending **Ain Shams Hospital (2015)** in Egypt who studied Impact of counseling program on Knowledge and self-efficacy of patients with implanted permanent pacemaker A convenience sample of 35 adult patients from both genders revealed that slightly less than two thirds of them were, illiterates this finding incongruent with **Abdul-Hussein et al. (2020)** in Iraq, Who studied Effectiveness of an Instructional Programs on Patient's Knowledge Regarding Self- Care Management after Ischemic Heart Disease the studied sample size was 50 patients who mentioned that improve the patient' knowledge in post program implement. My opinion is the education enhances the awareness about diseases and increases their knowledge regarded to permanent pacemaker.

As regards occupation, the current study revealed that more than half 52.7%of adult clients were worker with hard work that more than two third of adult client with a permanent pacemaker at home finding on the same line**, Mohamed et al. (2016)** in Egypt who studies Effectiveness of Educational Program on Knowledge And Practice of Patients Undergoing Permanent Pacemaker the studied sample was 50adult patient, who Mentioned that sample the study had jobs that require muscular effort. This finding incongruence with **Sharma et al. (2018)** in India who studied Assessment of effectiveness of permanent pacemaker care guidelines on patient activity and adherence The total sample size was 100 adult patient with permanent

pacemaker from both gender who showed the studied samples were unemployed 70%.this may be the studied sample had jobs that require muscular effort and work stressors that effect on cardiac efficacy and cause cardiac disease.

As regards smoking, the current study revealed that two third of adult clients were smoker. This finding on the same line with **Sharma et al. (2018)** in India who studied Assessment of effectiveness of permanent pacemaker care guidelines on patient activity and adherence The total sample size was 100 adult patient with permanent pacemaker from both gender who showed the studied samples were more than three quarter of them were smoker 76.0%.I t may could be, explained that, the nicotine content of cigarettes causes vasoconstriction and the production of carbon monoxide, which place a demand on the heart and interfere with oxygen supply recognized that lifestyle measures that reduce risk of cardiovascular disease recognized that lifestyle measures that reduce risk of cardiovascular disease include smoking.

Concerning level of knowledge related to a cardiovascular system (heart), the result of this study found that more than two third of adult client with a permanent pacemaker at home have incorrect knowledge regarding to a anatomy and physiology of the heart, **(table 2).** This finding goes with **Laddawan et al. (2019)** in Iran who studied The Effect of Education and Social Support Program on Health Behaviors in Patients with Cardiac Permanent Pacemaker, the studied sample were 44 patients with apermanent pacemaker, inadequate knowledge related to apermenant pacemaker

The is finding an congruent with **Sreelekshmi, (2011)** in Pakistan who studied that Assess the knowledge of homecare management of permanent pacemaker implanted patients, the studied sample were 93 adult patients who stated that, studied sample, had inadequate knowledge regarding homecare management post permanent pacemaker implantation. This might be attributed that approximately half of studied sample were illiterate. So, they cannot read or seek information about pacemaker.

Concerning knowledge about pacemaker the present study revealed that less than one third of them were a correct knowledge about a permanent pacemaker

This is on the same line with the same line with **Shen et al. (2019)** in China Who studied that Effect of peer support on health outcomes in patients with cardiac pacemaker implantation, the studied sample were 76patients Reaveld that lack in their knowledge This could be due to lack of knowledge and awareness impotent know how to deal with the artificial permanent pacemaker.

In the present study, more than half of adult client had incorrect knowledge regarding to a permanent pacemaker) in pre educational program and there was improvement of knowledge post educational program and there was statistical significant difference between pretest level of knowledge and post educational program $p<0.000$, **(table 3)**. this result goes with **Khalil, (2020)** in Egypt who studies effect of educational program on outcomes of patients undergoing permanent pacemakers' implantation the study sample was a convenient sample of 35 adult patients from both genders, showed that majority of the studied sample had satisfactory knowledge immediately post educational intervention, improved to 85.7%. But this results are not agree with **Elsayed, (2013)** in Egypt who studied factor effecting compliance of patients with permanent pacemaker regarding therapeutic regimen faculty of nursing Ain shams university the study sample were 50 adult patients from both genders,. Showed that most of patients had unsatisfactory level of knowledge. This could be to sufficient information & knowledge provided to the adult clients and adequate knowledge regarding how to deal with permanent pacemaker at home in the educational program.

Regarding to self-care of adults clients with a permanent pacemaker at home about to their daily living activities, showed that improvement their practice in post educational program implementation compared to in pre

educational program implementation **(table 4).** This finding goes with **Bekir, (2018)** in Turkey who studied How Do Patients Understand Safety for Cardiac Implantable Devices? Importance of Post intervention Education the studied sample was 28 adult patient with a permanent pacemaker who showed that improved awareness on topics related to physical and daily life activities including work, driving, sports after intervention education. Also this finding on the same line with **Shen, (2018)** in China Who studied that Effect of peer support on health outcomes in patients with cardiac pacemaker implantation, the studied sample were 76patients Raveled that improves in their self-care ability after the peer support program implementation. This could be lack of knowledge in preprogram implementation had effect on the their practices.

This current study regarding to their diet showed that Pre educational program less than one third of adult client with a permanent pacemaker at home improved to more than one third in post educational program implementation **(table 5)**. This finding on the same line with **Mohamed et al. (2015)** in Egypt who studies the Impact of Nursing Teaching Protocol on reduction of Complications for Patient with Permanent Artificial Pacemaker, The studied sample was 30adult patients revealed that, low percentages were found to having the habit of high fat intake, with mild salt intake and balance diet 33.

Concerning to their self-care about general precaution **(table 6)** showed that deficit their practice less than one third.

Regarding their self-care about Important of the follow up toward the permanent pacemaker showed that **(table 7).**

This present study **(table 6 & 7).** This finding goes with **Sharma et al. (2018)** in India who studied Assessment of effectiveness of permanent pacemaker care guidelines on patient activity and adherence the total sample size were100 adults patients with permanent pacemaker from both gender who showed that the dependence in performance of activities of daily living & regular follow ups were improved in after intervention. This indicated this could be due to the positive impact of implementation the educational program on the studied sample.

The results of the present study showed that, most studied sample had unsatisfactory bout their practice. This finding is agreement with **Mohamed et al. (2016)** in Egypt who studies Effectiveness of Educational Program on Knowledge and self-care of Patients Undergoing Permanent Pacemaker the total sample was 50 patients, who showed that, most patients had unsatisfactory practice regarding caring of wound care and redial pulse measuring.

The current study finding revealed that in **(table 8)** more than half of adult client with a permanent pacemaker had a good score in post educational program implementation, regarding their practice about dealing with their home environment devices this finding on the same line **Medtronic, (2017)** who studies Patient services electromagnetic compatibility guide for implantable cardiac devices, recommended that patients must keep them away of electromagnetic fields in their home environment at least 6inches equal 15 centimeters. Also this finding on the same line with **Bekir, (2018)** in Turkey who studied How Do Patients Understand Safety for Cardiac Implantable Devices? Importance of Post intervention Education showed that could be due acquired the knowledge about how to deal with permanent pacemaker by the sessions, and the practical content and the illustrated instructional booklet with pictures.

Conclusion

More than one third of studied sample aged 60 or more years Majority of study sample were married, more than three quarters of them poor self-care toward a permanent pacemaker at home.

Recommendation

Establish of educational program for adult clients with a permanent pacemaker at home to improve their knowledge and self-care practice toward permanent pacemaker at home.

A further research on a large sample is recommended to achieve more generalization.

Financial support:
No funding was received
Conflict of interests: No

References

Abu-Salem, E., Abdel El-Fatah, S., Gomaa, N. and Abdel-Aziz, A. (2017): Emotional and physical rehabilitation protocol for patients undergoing permanent cardiac pacemaker implantation, Available at: pacemaker implantation, Available at: www.bsu.edu.eg/ Backend/ Uploads/PDF/Prof/ Researches/ En/543.docx

Ahmed Abdul-Hussein Kittan & Rajha Abdul Hassan Hamza (2020): Effectiveness of an Instructional Programs on Patient's Knowledge Regarding Self-Care Management after Ischemic Heart Dise available at http://medicopublication.com/ index.php/ijfmt/article/view/207/203

Ahmed, A., Jurgens, Goodlin, S., Dolansky, M., Fonarow, G., Boxer, R., Arena, R., Blank, L., Buck, H., Cranmer, K., Fleg, J., Lampert, R., Lennie, T., Lindenfeld, J., Piña, I., and Semla, T. (2015): Heart failure management in skilled nursing facilities: A scientific statement from the American Heart Association and the Heart Failure Society of America, Journal of Cardiac Failure, 21(4): 263–299.

American Heart Association, (2017): Living with your pacemaker. available at: https://www.heart.org/ en/health-topics/arrhythmia/ prevention--treatment-of-arrhythmia/living-with-your-pacemaker

Bekir, S., Yildiz, Gulin, F.Y., Izzettin, A., Ismail, D.K., Harun, E. & Hande S. (2018): How Do Patients Understand Safety for Cardiac Implantable Devices? Importance of Post intervention Education**.**

Bhamri, N. (2017): New Generation Pacemakers, Available at: https: //www.maxhealthcare.in/blogs/cardiac-sciencescardiology/new-generation-pacemakers.

British Heart Foundation (2016): Understanding the cardiovascular system. Https: //www.bhf.org.uk/ heart-health/how-your-heart-works/ your-heart-and-circulationwww.bsu. edu.eg/Backend/Uploads/PDF/Prof/Researches/En/543.docx.

Campbell, R. (2009): Biology 7th Lippincott. Williams & wilkims, P.p: 873.

Chapagai Swaty,*, Andrews G. Rache & Naik Nitish (2017): Study to Assess the Knowledge and Quality of Life of Pacemaker Patients with a view to Develop an Information Booklet.

Chauhan, A., Grace, A.A., Newell, S.A., Stone, D.L., Shapiro, L.M., Schofield, P.M. and Petch, M.C. (1994): Early complications after dual chamber versus single chamber pacemaker implantation. Pacing Clin Electrophysiol; 17(11 Pt 2): 2012-5.

Devices Melanie M Steffen, Jeffery, S. Osborn, Michael J &Cutler et al. (2019): Cardiac Implantable Electronic Device Therapy: Permanent Pacemakers, Implantable Cardioverter Defibrillators, and Cardiac Resynchronization. Available at: https: //pubmed.ncbi. nlm.nih.gov/ 31378335/

Elsayed, R. (2013): Factor effecting complianceof patients with permanent pacemaker regarding threputic regimen.faculty of nursing. Ain shams university.

Fuster, V. and Walsh, R. (2011): Hurst's the heart, 13th ed; new York, pp1037:1055.

Health, U.W. (2017): Health information: Health Facts for You, Home Care after Permanent Pacemaker Placement, at: http://www.uwhealth. org/healthfacts/cardiology/ 5094.html.

Ibrahim, R. & Afzal, R. (2017): Anatomy, Thorax, Heart. https: //www.ncbi.nlm.nih.gov/books/NBK470256/t.

Khalil, H., Soliman, M., Ahmed, H. & Hamza, E. (2020): Effect of Educational Program on Outcomes of Patients Undergoing Permanent Pacemakers' Implantation. Evidence-Based Nursing

Research, 2(4), 13. https://doi.org/10.47104/ ebnrojs3.v2i4.167

Laddawan, P. & Noraluk, U. (2019): Care of Patients with Permanent Cardiac Pacemaker: Nurse's Roles https://he02.tci-thaijo.org/index.php/RNJ/issue/view/16285

Medtronic (2017): About tachycardia (fast heartbeat). Available from: https:// www.medtronic.com/au-en/your-health/conditions/fast-heartbeat.html.

Mohamed, A.A., Shreif, W.I., Hanan Mohamed, H.M., Mohamed & Maaty, A.L. (2016): Effectiveness of Educational Program on Knowledge And Practice of Patients Undergoing Permanent Pacemaker e-ISSN: 2320–1959.p- ISSN: 2320–1940 Volume 5, Issue 6 Ver. VI (Nov. - Dec. 2016), PP IOSR Journal of Nursing and Health Science (IOSR-JNHS) 72-83.

Muhammad, T. and Liaquat, T. (2020): Pacemaker Malfunction Alzahrani2 St. Joseph's University Medical Center. available at: https: //www.ncbi.nlm.nih.gov/books/NBK553149

Mulpuru, S., Madhavan, M, McLeod, C., Cha, Y., and Friedman, P. (2017): Cardiac pacemakers: Function, Troubleshooting, and Management: Journal of the American College of Cardiology, 69(2): 189–210.

Nasr, M.H., El Ganzory, G.S. & Abdelstar, M.A. (2015): Impact of counseling program on Knowledge and self-efficacy of patients with implanted permanent pacemaker. Journal of American Science, 11(6): 297-306.

Sharma, K., Shruti, Singh, N.V., and Sharma, Y.P. (2018): Assessment of effectiveness of permanent pacemaker care guidelines on patient activity and adherence.

Shen, Z., Zheng, F., Zhong, Z., Ding, S., Wang, L. (2018): Effect of peer support on health outcomes in patients with cardiac pacemaker implantation: A randomized, con-trolled trial. Nurs Health Sci. 2019;1–9. https://doi.org/10.1111/ nhs.12595SHEN ET AL.9

Snegalatha, D., Anand, J., Seetharaman, B. and John, B. (2019): Knowledge and attitude regarding permanent pacemaker and the quality of life of patients after permanent pacemaker Indian J Cont Nsg Edn; 20 Available at: http: //www.ijcne.org/ article.asp?issn=22307354;year=2019;volume=20;issue=1;spage=33;epage=39;aulast=SnegalathaIndian J Cont Nsg Edn 2019;20:33-9

Sreelekshmi, V. (2011): A study to assess the knowledge of homecare management of permanent pacemaker implanted patients in Sctimst, Trivandrum, Diploma in cardiovascular and thoracic Nursing, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, pp1: 23. 10.

Sundjaja, J.H. & Bordoni, B. (2020): Anatomy, Thorax, Lung Veins. Stat Pearls.Availablefrom:https://www.livescience.com/42081-normal-heart-rate.html (accessed 03/02/2020).

World Health Organization (2021): Sexual and Reproductive health Avialble at Available at: https://www.who.int/reproductivehealth self-care-interventio ns/ definitions.