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Effectiveness of Educational Program on Knowledge And Practice of Patients Undergoing Permanent Pacemaker.

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Abstract
Background: *A cardiac pacemaker is an electronic device that delivers direct stimulation to the heart, with the purpose of initiating and maintaining the heart rate when the heart's natural device that electrically stimulates myocardium to depolarize, to begin a contraction, when the heart's natural pacemaker does not function properly. This device may be temporary or permanent, depending on the patient's condition*. ***Objectives:*** *The aim of this study is 1- Assessment patients knowledge and practice of patients undergoing permananent pacemaker.2- evaluate the effectiveness of educational program on knowledge and practice of patients undergoing permanent pacemaker.*
Design: *A quesi experimental design will be used to conduct this study. This study will be conducted at Cardiology Ward in Specialized Medical Hospital in Mansoura University The study will be including patients who are undergoing pacemaker implantation. The calculated sample size of the study was 50.*
Tools of the study*: Data will be collected using the following three tools* ***1*** *Socio-demographic data Sheet.* ***2-*** *Knowledge Assessment questionnaire: to assess level of knowledge regarding permanent pacemaker baseline, immediately and after 4 weeks later.* ***3-*** *Wound Care performance check list,* ***4-*** *Radial pulse performance check list the collected data were organized, tabulated and statistical analyzed using the statistical package for social science (SPSS).*
Result: *the present study revealed that there was a statistically significant difference in patients knowledge and practice baseline, Immediately, after 4 weeks of program implementation were ($p<0.001$).*
Conclusion: *More patients had inadequate (knowledge and practice) regarding pacemaker pre implementing education program performance (knowledge and practice) with improve their knowledge regarding permanent pacemaker implantation. A simplified introduced to the educated patients after permanent pacemaker implantation at discharge and should be clearly explained by photos for illiterate patients.*
Keywords*: Education program, Patients, Permanent pacemaker, Wound care.*

What is already known about the topic?
Educational program is an approach that has established increasing attention in recent years, mainly in the context of higher education. Self learning is essential in assisting patients to meet the challenges presented in today's health care environment.
What this paper adds?
This paper provide insight about improvement in knowledge and practice score post implementing educational program on patients with permanent pacemaker accepted with the research hypothesis.

I. Introduction

A cardiac pacemaker is an electronic device that delivers direct stimulation to the heart, with the purpose of initiating and maintaining the heart rate when the heart's natural pacemaker is unable to do so ***Nettina (2010).*** It is an artificial device that electrically stimulates myocardium to depolarize, to begin a contraction, when the heart's natural pacemaker does not function properly. This device may be temporary or permanent, depending on the patient's condition ***(Karen, 2009)***.

It is indicated for conditions that result in failure of the heart to initiate or conduct an intrinsic electrical impulse at a rate adequate to maintain perfusion. Pacemakers are necessary when dysrhythmias or conduction defects compromise the electrical system and the hemodynamic response of the heart ***(Morton, Fontaine, Hudak & Gallo, 2010)***.

Today, pacemakers are used to manage symptomatic bradycardia but rising cost of technology that saves life has been out of reach for many poor patients leading to morbidity and death. Each year 1-2 million individuals worldwide die due to a lack of access to pacemaker. **(Mcmullan & Valento, 2012).**

There are currently more than 3 million patients worldwide with implanted permanent pacemaker. In Europe, Japan and USA, the implantation rate is almost 300-1000 per million. In United States, the prevalence of third-degree AV block is 0.02%. Worldwide, the prevalence of third-degree AV block is 0.04%. The incidence of AV conduction abnormalities increases with advancing age. **Strickland (2013**). Modern pacemakers can be externally programmed allowing pacing modes to be optimized for individual patients. **(Anne & Gillis, 2012).**

Studies have shown that non-compliance causes 125,000 deaths annually in the USA, leads to 10 to 25% of hospital and nursing home admissions and is becoming an epidemic **Koop(2007).** International Management of permanent pacemakers is a difficult challenge for both cardiology and infectious diseases specialists. (Reported incidence of complication rates of permanent pacemakers range from 0.19% to 13.9% and to 0.8% for permanent pacemakers, respectively). Patients with permanent pacemakers can present with a pulse-generator pocket infection or blood-stream infection. **(Brian & Marton, 2010).**

Permanent pacemaker can greatly improve quality of life and for some people it can be lifesaving and preventing death. Optimal outcome after permanent pacemaker insertion can only be obtained if patients are supported in compliance to a lifelong with permanent pacemaker. **Timby and Smith (2010)** Patients' not have any knowledge about permanent pacemaker is one of the most serious problems facing healthcare today **(Cameron & Wiley, 2008).**

II-Subject And Methods

1- Reserch design

A quesi experimental design was utilized.

2- Participants

The research met patients at Cardiology Ward and out patients clinic in Specialized Medical Hospital in Mansoura University The study will be including patients who are undergoing pacemaker implantation. The calculated sample size of the study was 50.

3- Data Collections Instruments

1- Socio-demographic data Sheet:

It will include socio-demographic characteristics of the patients such as age, sex, level of education, occupation, marital status, monthly income and co-morbid diseases**.**

2- Knowledge Assessment Questionnaire:

To assess level of knowledge regarding permanent pace maker baseline, immediately and after 4week later This tool will be modificated by the researcher after extensive literature review Scoring system answer were either yes, No, Don't know with total score=45 score, 1score was given when the response to correct, zero score was given when the response to incorrect and don't know. The satisfaction level of knowledge started from 75% while the un satisfaction level was less than 75%.

3- Wound Care Performance Check List:

This tool including assessment and evaluation of the healing are important components of wound care. All wound needed to assess sign of infection (redness, malodor, localized pain, localize heat, delaying or abnormal healing) and clean of wound by using sterile technique This tool consisted 11 statement the response was on scale one (Done cor**rect)** zero (Not done). A total mean for patient's practice was categorized in to unsatisfactory or satisfactory; the total score was 11 and divided into two categories as follows: <75 % was considered unsatisfactory-≥ 75 % was considered satisfactory.

4- Radial Pulse Performance Check List:

This tool will be developed by the researcher after literature review this tool used to assess patients ability to measure radial pulse. This tool consisted 7 statement the response was on scale one (Done cor**rect)** zero (Not done). A total mean for patient's knowledge was categorized in to satisfactory or unsatisfactory; the total score was 7 and divided into two categories as follows- ≥75 % was considered satisfactory<75 % was considered un satisfactory.

Operation Design: The operation design includes preparatory phase, validity, pilot study and field work which include data collection (assessment phase, planning phase, implementation phase and evaluation phase).

Preparatory Phase: It included reviewing of related literature, and theoretical knowledge of various aspects of the study using book, articles, internet, periodicals and magazines to develop the theoretical part of the study and data collection tools.

***Validity*:**

The validity of the proposed tools was achieved through face and content validity. This stage was achieved through a jury of 5 experts ,three Ng professors from medical surgical nursing department of faculty of Nursing, Mansoura University and two physician, professor of Medicine and Cardiology, faculty of Medicine, Mansoura University The expertise reviewed the tool for clarity, relevance, comprehensiveness and simplicity: minor modifications were done.

***Reliability*:** The reliability of proposed tools was done by Cronbach alpha test 93,3%.

Pilot Study: A pilot study was conducted to test feasibility and applicability of the tools used in this study. It was carried out on 10% patients of total study subjects. The patients who were included in the pilot study were excluded from the sample and no modification was done after conducting pilot study.

Field work: The purpose of the study was simply explained to the patients who agreed to participate in the study prior to data collection. Data collections started from December 2014 until October 2015. Data collection was conducted through four phase (assessment phase, planning phase, implementation phase and evaluation phase).

***Assessment phase*:**

This phase include assessment of the knowledge and practice for patient undergoing permanent pacemaker through using the developed tools (pre test).

Planning phase:

Based on work completed in phase one, the investigator designed the educational program based on assessment of the studied patients through reviewing the related literature. The education program was covering the theoretical and practical skills. A booklet containing the content of program was designed by researcher and it was written in simple Arabic language and supplemented by photos and illustration to help patients understanding the content.

III-Results

Table (1): as regard ages, More than one third of the study sample aged between 40 to 49 years. More than half of the sample (6o %) were male. Two third of the sample (70%) were married. half of the sample moderate education, (50%). more than half of the sample (62%), were living in rural areas. The majority of sample (88 %) living with family, and (70.2%) of sample the study had jobs that require muscular effort. Most of the study sample (52%) had past history of cardiac diseases. Three quarter of sample the study (76%) had monthly income in adequate for treatment cost, and had high transportation costs of the study sample about (54%).

Table(2): Shows that, the study sample of (18%) had past history of cardiac diseases, also (12 %) of the study sample had hypertension, and (8 %) had diabetes mellitus, but (4%) of them had kidney diseases, liver diseases or other diseases (6 %, & 4 %).

Table (3) Show that, There were a statistically significant difference in knowledge level baseline, immediate, after4 weeks of program where $P<0.001$.

Table (4): show that, there were statistically significant difference between of the patients knowledge of patient were had permanent pacemaker baseline, immediately, after 4 weeks about device, description, pacemaker precautions, information before insertion information during procedure, information after pacemaker insertion, movement and medication and follow up It has improved immediate and after 4 weeks of implementing of education program ($p<0.0001$).

Table (5): Show that, there is high statistically significant difference between level of the patients practice regarding wound care post implementing education program were $P<0.0001$, i.e. improved in practice after 4 weeks of education program.

Table (6): Show that ,there were statistically significant difference in patients practice regarding redial pulse measuring were had permanent pacemaker baseline, Immediately, aftert 4 weeks of program implementation were ($p<0.001$). i.e improved practice related to redial pulse measurement immediately after the program as post 4weeks of implementing the program.

Table (7): Show that, there were statistically significant difference in practice level pre, immediately, after 4 weeks it of program were ($p<0.0001$).

Table (8): Show the direct correlation between knowledge and practice, after 4 weeks of implementing of education program positive correlation and there is statically significant implementing of education program (p>0.05).

Table (1): Distribution of the studied sample regarding demographic characteristics.

Parameter	**n = 50**	
	No	**%**
Age in years		
20<30	2	4
30 <40	9	18
40<50	23	**46**
50 ≤ 60	16	32
Sex.		
Male	30	**60**
Female	20	40
Marital Status		
Married	35	**70**
Single	5	10
Widow	10	20
Divorced	0	0
Level of Education		
Illiterate	3	6
Read/write	15	30
Moderate education	25	**50**
high education	7	14
Residenence		
Rural	31	**62**
Urban	19	38
Living status		
Alone	5	10
live with family	44	**88**
live with other	1	2
Job		
Require Mental effort	15	30
Require muscular effort	35	**70**
Parameter	**n = 50**	
	No	**%**
Adequacy of monthly Income		
Adequate	12	24
in adequate	38	**76**
Treatment affordability		
free	1	2
Health insurance	23	**46**
Ministerial decree	20	40
The patient own expense	6	12
High transportation costs		
Yes	27	**54**
No	23	46

Table (2): Distribution of medical history of the study patients (n =50).

Items	**Yes**	
Co-existing diseases	**No**	**%**
Cardiac diseases	9	18
Hypertension	6	12
Diabetes mellitus	4	8
kidney diseases	2	4
liver diseases	3	6
Other chronic diseases	2	4
Total	**26**	**52**

Table (3): Comparing total knowledge level (at base line, immediate and Knowledge after 4 weeks) in the study group n=50 patients

	Knowledge					
	Baseline		**Immediate**		**After 4 weeks**	
	No	%	No	%	No	%
Unsatisfactory	45	90	7	14	15	30
Satisfactory	5	10	43	86	35	70
Test of significance			•χ^2 = 36.02 **P< 0.0001****		χ^2 =38.03 **P< 0.0001****	
Median (Min - Max)	12 (0 - 43)		38.5 (11- 45)		31.5 (7 - 44)	
Test of significance			∞Z = 6.2 **P< 0.0001****		Z = 6.1 **P< 0.0001****	

Table (4): Comparison of the(base line knowledge level with immediate knowledge and Knowledge after 4 weeks) in the study group n=50

Parameters	**Baseline**	**Immediate**	**After 4weeks**
	Median (Min - Max)	Median (Min - Max)	Median(Min - Max)
Device descrption	0 (0-9)	7 (0 - 9)	5 (0 - 9)
		Z = 6.02 **P< 0.0001****	Z = 5.1 **P< 0.0001****
Peace maker precautions	1.5 (0 - 11)	10 (0 - 11)	9 (0 - 11)
		Z = 6.02 **P< 0.0001****	Z = 5.9 **P< 0.0001****
Information about procedure preparation	4 (0 - 5)	5 (1 – 5)	5 (0 - 5)
		Z = 3.6 **P< 0.0001****	Z = 2.1 **P< 0.0001****
Information during procedure	0 (0 - 5)	5 (0 - 5)	3(0 - 5)
		Z = 5.8 **P< 0.0001****	Z = 4.9 **P< 0.0001****
Information after procedure	2 (0- 4)	5 (1 - 5)	4 (0 – 5)
		Z = 6.1 **P< 0.0001****	Z = 5.8 **P< 0.0001****
Movement and activity daily living	2 (0 - 6)	7 (1- 7)	6 (1 - 7)
		Z= 6 **P< 0.0001****	Z= 5.9 **P< 0.0001****
Medication and follow up	0 (0 - 3)	**3 (0 - 3)**	3 (0 - 3)
		Z = 5.3 **P< 0.0001****	Z = 5.02 **P< 0.0001****

Table(5) : Comparing total practice of wound care at base line, Immediate and after 4 weeks after in a study group(no=50).

	Wound Care					
	Base line		**Immediate**		**After 4 weeks**	
	No	**%**	**No**	**%**	**No**	**%**
Unsatisfactory	30	60	17	34	12	24
Satisfactory	20	40	33	66	38	76
Test of significance			**P< 0.0001****		**P< 0.0001****	
Median (Min - Max)	8 (1 - 11)		10 (4 - 12)		11 (4 - 11)	
Test of significance			∞Z = 3.6 **P< 0.0001****		∞Z = 4.1 **P< 0.0001****	

Table (6): Comparing between patients practice related to measuring radial pulse among studied patients at (base line, Immediate and post after 4 weeks of education program (no=50).

	Redial Pulse Measuring		
	Base line	**Immediate**	**after 4 weeks**
Test of significance		•χ^2 = 26.04 **P< 0.0001****	•χ^2 = 28.03 **P< 0.0001****
Median (Min - Max)	0 (0 - 6)	6 (0 - 7)	6 (3 - 7)
Test of significance		∞Z = 6.1 **P< 0.0001****	∞Z = 6.2 **P< 0.0001****

Table (7): Comparing total practice level (at base line, Immediate and after 4 weeks in the study group (no=50).

	Total Practice					
	Base line		**immediate**		**After 4 weeks**	
	No	%	No	%	No	%
Unsatisfactory	49	98	18	36	12	24
Satisfactory	1	2	32	64	38	76
Test of significance			•χ^2 =29.03 **P< 0.0001****		•χ^2 = 35.03 **P< 0.0001****	
Median (Min - Max)	8 (1 - 17)		16 (4 - 19)		16 (7 – 18)	
Test of significance			∞Z = 5.6 **P< 0.0001****		∞Z =6.1 **P< 0.0001****	

Table (8): Correlation between level of the total knowledge and practice with basal line, Immediate and after 4 weeks after implementing education program (no=50).

	Total knowledge score					
	Baseline		**Immediate**		**After 4weeks**	
Total Practice score	**R**	**P**	**R**	**P**	**R**	**P**
	0.2	0.2	0.3	0.2	**0.4**	**0.004**

IV- Discussion

Permanent pacemaker can greatly improve quality of life and for some people it can be lifesaving and preventing death. Optimal outcome after permanent pacemaker insertion can only be obtained if patients are supported in compliance to a lifelong with permanent pacemaker. **Timby and Smith (2010)** Patients' not have any knowledge about permanent pacemaker is one of the most serious problems facing healthcare today **(Cameron & Wiley, 2008).**

An education program was designed for patients with pacemaker to help them in adaptation to the new device and improving quality of life .patients with permanent pacemaker have changes in the body image, problem in psychosocial adaptation and problems in quality of life parameters**(Yousef, 2014)**

Therefore, the present study has been designed aiming to **first:** Assess patient's level of knowledge and practice with permanent pacemaker **Second** Evaluate effectiveness of educational program on knowledge and practice with pacemaker immediately and after 4 weeks.

The study hypothesized that, there will be improvement in knowledge and practice score post implementing educational program on patients who are undergoing permanent pacemaker.

Discussion of the findings of this study will cover following the main areas **1.** Demographic characteristics of patients under study, 2- Comparison between the' level of knowledge and practice of (baseline, immediate and post 4 weeks) after implementing education program **3-** Relationship between socio demographic characteristics patients knowledge and practice.

1. Demographic Characteristics Of The Studied Sample:

As regards age, the present study indicated that, most of the study sample ages were ranged from 40 to 50 years. This may be due to recurrent exposure to life stressors and responsibility. This Finding is agreement with that of **Elsayed (2013)** Who reported most of the study sample ages 40 to 50 years, this finding is

consistent with what was reported by **Hildick and Smith (2011)** That, there have been significant increases in incidence of Permanent pacemaker Implantation over 40years**. Abd Elsalam (2010)** reported that although pacemaker are implanted in individuals of all ages ,but 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, more than study sample were male. This finding is in agreement with that of **Elsayed (2013) and Panda (2011)** who found that, prevalence of permanent pacemaker in males was 1.5 times that in females.

Concerning marital status, the results revealed that, most of the patients under the study were married 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 this result supported with **Youssef (2014)** who stated that marriage increase the patients responsibility about the family and children in addition it increase the stressor . This finding goes in the same line with **Abdel mawlaa (2010) and Elsayed (2013) .**who found that, the majority of study sample were married.

In relation to education, the present results showed that half of patient with moderated education, this result not agree with **Elsayed(2013) and Abd Elaziz (2007)** 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. The researcher opinion is the education enhances the awareness about diseases and increases the ability of recognition about everything related to treatment plan.

Regarding residence, the current study showed that more of the patients under study were living in rural areas. This may be due to unavailability of specialized hospitals affording pacemaker insertion in rural areas. This result is in accordance with **Hussein (2005) and Elsayed (2013)** who

found that, approximately two thirds of their studied subjects were residing in rural areas.

As regards having co-existing diseases the present study revealed that more than half of sample studied have chronic diseases and especially chronic heart diseases common with permanent pacemaker , this result not agree with **youssef (2014)** who reported that the minorities of patients have chronic heart diseases .and his result in agreement with the study of **Elsayed (2013)** which done in Ain shams hospital and included sample size 85 who showed that most of patient under the study cardiac diseases.

Concerning economic factors that affect patient's, the current study displays that, the majority of the patients under study had inadequate monthly income for treatment costs and the most of them complained from high transportation and medications costs. This could be attributed to their low socioeconomic class, and that, most of them were living in rural area and due to the changes in their work abilities and increase in the daily living finance. this result in agreement with the study of **Elsayed (2013) and youssef (2014)** Who report more than three quarters of the patients under study had inadequate monthly income for treatment costs and the majority of them complained from high transportation and medications costs.

Moreover, healthcare expenditure could be a large portion of living expenses for patients suffering from cardiac diseases **(Ginniset, al., 2009).**

Concerning relationship between medical team and patient, it is obvious that, most of patients under the study reported that the nurse don't give them medical instructions they should follow and doctor never allow them enough time to ask questions. These could be due to the high flow rate of patients in specialized medical hospital in Mansoura University so the doctors or nurses don't have enough time to give every patient complete medical instruction. This finding is in agreement with **Marzouk (2009)** who stated that, the nurses never give the patient's medical instructions should follow.

On the same scope; **Rubin (2005)** concluded that, a healthy relationship is based on patients' trust in prescribers and empathy from the prescribers. Studies have found that, compliance is good when doctors are emotionally supportive, giving reassurance or respect, and treating patients as an equal partner.

Educational Program And Knowledge Level:

Regarding patients' knowledge about device description and function, precautions for pacemaker, activity and follow up, the results of the present study showed that, the current study revealed that the level of knowledge regarding permanent pacemaker pre implementing of the educational program was unsatisfactory in most of patients while post program there were improvements with highly statistically significant differences baseline, immediate and post 4 weeks is caused by the education program This findings are in agreement with**(Tagney , 2010).**

Youssef (2014), Malm and Fridlund (2007) who demonstrated strong and constant improvement of the knowledge level after the education program from more than half of their study sample to ninety percent and eight nine percent, at pre, post education program and at follow up respectively**,** But this results are not agree with **Elsayed (2013)** he said the results of this study showed that most of patients had unsatisfactory level of knowledge. This might be attributed to the fact that less than half of them were illiterate. So, they cannot read or seek information about pacemaker. Also, this could be due to that all patients stated that, the nurses weren't

explaining instructions to be followed and most of them didn't take information about precautions related to permanent pacemaker.

Persistence improvement of knowledge level of the study subjects was due to the provision of the educational booklet with clear information, and simple language. In addition, the curiosity of the study subjects to know how deal with the permanent pacemaker when given verbal instructional information about it.

Moreover, **Faltas (2013)** mentioned that the patients were affected by written information which given to them and he found that the patients who received the booklet had increasing knowledge and were more satisfied with information given about their diagnosis when compared with the control group.

As well, **Orly and Orna (2008), Stewart and Anna (2009)** found that the level of knowledge was low before the education session, but was higher after the sessions , knowledge levels increased in all patients young and older ,and they stated that the patient who acquire knowledge has an active life after permanent pacemaker implantation ,suitable educational material delivered can foster positive attitude and independence in these patients.

Regarding patient's knowledge and practice, the current study revealed that the level of knowledge and practice regarding caring with pacemaker pre implementations of education program are inadequate; while post there are improvement with statistically significant difference between baseline, immediate and post the program implementation and the improvement of the patients' knowledge and practice retained significantly post program, This is supported by **(Metwally, 2009).**

Regarding patient's practice the results of the present study showed that, most patients had unsatisfactory practice regarding caring of wound care and redial pulse measuring. This could be due to lack of standardized nursing care for patients, and lack of advanced devices. But after education program, there was an improvement in wound care and measuring pulse. These findings may be due to continuous demonstration, re demonstration during the sessions, and the practical content and the illustrated instructional booklet with pictures. This finding is supported by **Elhadary (2009) , Abd Elsalam (2010) and (youssef, 2014)** who mentioned that high statistical significant of patients performance after education program and follow up .

Moreover, **Mohamed (2006), and Refaii (2011)**, found an improvement level of the study group in practice score post implementation of education program as compared to control group with highly statistically differences between the two group during the post and follow up assessment.

Regarding to wound care and measuring redial pulse, the results of current study revealed that there is a statistically significant difference at baseline, immediate and post 4 weeks in all items of patients practice to patient become oriented and how to measure redial pulse and recorded in follow up card and make wound care daily.

This is in agreement with **Ahmed (2009) and youssef (2014)** who found a significant improvement in patient's practice after educational program, and this result not agree with **Elsayed (2013)** who found about half of the study sample never do wound dressing daily This may be due to inadequate instructions about wound care and complication prevention or inadequacy of income to buy dressing supplies This finding is not agreement with **Marzouk (2009)** who found that, more than half of the sample were never following precautions to care of wound .

Also, as mentioned by **Chon (2010)** the patients with permanent pacemaker should trained about sterile wound care as how to assess for signs of infection, importance of adequate nutrition protein and vitamins and ambulation to promote wound healing. Special precaution during bath, how to clean the wound area, avoidance of trauma and pressure over it, and support it with pillow during coughing and sneezing.

Nettina (2010) stated that, patients should completely protect pacemaker site against water during bathes and showers, not wears restricted clothes over the pacemaker site and women may find more comfortable to wear a small pad over the incision site as protection from their bra strap.

Regarding to Count pulse for 60 seconds showed that, two third studied sample, this result not agree with **Elsayed (2013)** who found, 45.9 % of the study sample were never measuring pulse daily or recording in ID card.

Regarding patients' knowledge and practice about pacemaker the present study revealed that, immediate and post implementing educational program there were statistically significant improvements in their knowledge and practice. This could be due to the clarity, simplicity of the program content and it based on the patients needs. This is on the same line with **Tyson and York (2010)** who stated that the significant improvement in patients' knowledge and practice after using learning programs strengthen their and update knowledge and improve quality of care of life with pacemaker.

Also, **Chris and Charlie (2009)** agreed with this finding as they studied the "Influence of written information on patient's knowledge of their diagnosis" on 64 patients in Oxford University and found that patients receiving an information sheet were twice as likely to be correct with their main diagnosis compared with the control group. There was a tendency for patients receiving a sheet to have increased knowledge and practice of previous medical problems Moreover, the previous result was supported by **Coronary Heart**

Disease Team (2007) which emphasize that educational and learning program always keep and, maintain their speed and efficiency in carrying out their respective activities and so the quality of care will be improved.

Additionally, **Kabeel (2010)** stated that, the nurse helps the patient and family to set realistic achievable goals. A teaching plan that meets the patients' individual needs is developed with the patient and family. This is done several days before discharge to allow enough time for periodic reviewing of the plan and answering of questions. Specific instructions are provided about wound care, identification card, physical movement, medication, precautions and follow-up visits.

In this regard, **Zerwic (2007)** stated that, educated patient was promoted by clarification and explanation about everything. Therefore, the information provided through education programs sufficient to increase patients' desire and encourage them to comply with prescribed education after discharge. The patients who are oriented with every-thing about their disease are more likely to engage in activities that promote changing their behaviors, promote physical well-being and enhancing the education program than those who are not.

Lastly, as mentioned by **Lee (2007)** patient education after procedure does not end at the time of discharge. The patient is encouraged to maintain telephone contact with the surgeon, cardiologist, and nurse. This provides the patient and family with reassurance that questions can be answered and problems can be resolved when arise. The patient is expected to have a follow-up visit 4 to 6 weeks after discharge.

From the researcher point of view the rational for knowledge and practice improvement among the study subjects throughout the different assessment periods might be related to the provision of education program with CD for the patients, booklets and posters. Also, the curiosity of the studied subjects to know how to deal with the pacemaker, precaution of pacemaker and follow up and how to make wound care, and pulse measuring before, during and after procedure, and how does the pacemaker work in a correct way.

3- Relationship between socio demographic characteristics & patient's knowledge and practice:

The present study findings showed that, there is no significant relation between patients' knowledge and practice and socio demographic characteristics. This finding not agrees with **Elsayed (2013)** he said there is a significant relation between patients' knowledge and their age. This could be explained by the fact that an older adult are more experienced and knowledge able regarding importance of education program.

The present study finding show that, the relation between gender and patients' knowledge and practice not have significance this finding supported with **Elsayed (2013**) and **Lertmaharit et al. (2007)** who concluded that gender has not been found to influence with pacemaker Also **Tough (2011)** reported that gender may not be a good predictor of non-have significance .

This study revealed that, there is no statistically significant relation between co-existing diseases and patient knowledge and practice, so patient with medical diseases, this result not agree with **Elsayed (2013)** who revealed that, there is statistically significant relation between co-existing diseases and patients' knowledge. The results of this study may be due to, the too much restrictions imposed by the multiple diseases, so, they were pored and didn't comply.

This study revealed that, there is no statistically significant relation between patient income and knowledge and practice this result not agree with **Elsayed (2013)** who reported that findings of the study illustrated that, there is statistically significant relation between monthly income and to that, inadequate monthly income prevents them from attending follow up visits because most of them living in rural areas.

The current study revealed that there is statistically significant relation between patients' knowledge and patients' practice with pacemaker. This may be due to knowledge is the most important strategy to enhance practice to education program. This finding is consistent with **Ponnusankar et al., (2008)** who stated that, lack of knowledge and practice. On the same line **Smeltezer, Bare, Hinkle and Cheever (2010)** highlighted that, patients' education is very important to enhance knowledge and practice.

This study results so we accept the research hypothesis , the education program will affect positively on knowledge and practice score post implementing educational program on patients with permanent pacemaker .

V- Conclusion

From the results of the present study, it can be conducted that:

- More patients had inadequate (knowledge and practice) regarding pacemaker pre implementing education program.
- After Educational program had statistically significant positive effect on patient's performance (knowledge and practice) with permanent Pacemaker.

Recommendation

Based On The Findings Of The Present Study, The Following Recommendations Were Suggested:

1-Studying the possible strategies to overcome the factors affecting of patient with Permanent pacemaker regarding educational program.

2-A simplified and comprehensive booklet including guide lines about education program should be introduced to the educated patients after permanent pacemaker implantation at discharge and should be clearly explained by photos for illiterate patients.

3-Establishment of a hot line contact for urgent physician's consultations of patient with Permanent pacemaker.

4-Periodical Follow up for compliance of patient with Permanent pacemaker regarding education program

5-Further researches are recommended to evaluate the impact of implementing of educational program for with pacemaker on their outcomes.

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