Impact of counseling program on Knowledge and self-efficacy of patients withimplanted permanent pacemaker

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Abstract" Background: Patients undergoing permanent implantable pacemaker, challenge with multiple physical, psychological and social complications. The patients may perceive the pacemaker device as an electronic security or as a source of physical and emotional discomfort. **Aim:** Evaluate the effect of counseling program on knowledge and self-efficacy of patients with permanent pacemaker. **Design:** A quasi-experimental. **Setting:** The present study was conducted in both inpatient department and outpatient clinic of cardiology which are affiliated to Ain Shams university hospital. **Subjects:** A convenience sample of 35 adult patients from both genders undergoing permanent pacemaker and didn't participate in any previous educational programs regarding pacemakers were recruited. **Tools of data collection:** Three tools were used by the researchers: **1- Patients' interviewing questionnaire:** It is consisted of three parts: - demographic characteristics – patients' knowledge assessment sheet which was used as pre/posttests – Indicators of counseling program success which was used as a pre and follow up tests. **2- Pacemaker self-efficacy questionnaire** which was used as a pre/post and follow up tests to assess perceived self-efficacy. **3- Aga Khan University anxiety and depression scale:** it was used as a pre/post and follow up tests to assess psychiatric symptoms in the cardiac patients. **Results:** It was revealed that, 51.4% of the patients were females, 77.1% of them were married, and also 65.7% were illiterates and 62. % has jobs. Statistically significant differences were found between the pre/post and follow up tests after implementing the counseling program regarding all items of knowledge and self-efficacy ($p= <0.001$). There is a highly statistically difference in the post and follow up test compared to pretest regarding level of anxiety and depression. **Conclusion:** The counseling program had a positive effect in improving knowledge, anxiety and depression and in turn the self-efficacy of patients with permanent implanted pacemakers. There was also a positive correlation between levels of patients' knowledge as regards their self-efficacy and level of anxiety and depression. **Recommendations:** -The counseling program should be an integral part of the total management of patients with implanted pacemakers.-Long term effects of the counseling program should be further studied. - Education is extremely important for nurses counseling patients with implanted devices in order to play successful role as the continuous link to the multidisciplinary professional team that guide the oftentimes forgotten humanistic care of these patients.

1. Introduction:

The heart has its own built-in electrical system, called the conduction system. The conduction system sends electrical signals throughout the heart that determine the timing of the heartbeat and cause the heart to beat in a coordinated, rhythmic pattern. The electrical signals, or impulses, of the heart are generated by specialized tissue called the sino-atrial or sinus node. The sinus node is sometimes called the heart's "natural pacemaker". Problems with the flow of electrical impulses in the heart are called arrhythmias, which is a general term meaning that there is an abnormality in the pattern of electrical conduction or electrical rhythm **(Olshansky and Hayes, 2015)**.

Bradya-rrhythmias are heart rhythm abnormalities that cause an abnormally slow heartbeat. Most bradyarrhythmias are due to one of two kinds of problems; sinus bradycardia or heart block. Sinus bradycardia occurs when the heartbeat is too slow because the heart's "natural pacemaker" is operating too slowly. Heart block is a term for a delay or interruption in the heart's conduction system, causing the electrical impulses to travel too slowly or to be stopped **(Buellesfeld *et al.,* 2012)**.

The decision to treat an arrhythmia with an artificial pacemaker (or any other treatment) depends in part upon whether the person has symptoms or not as well as the severity of the symptoms. Artificial pacemakers are electronic devices that stimulate the myocardium with electrical impulses to maintain or restore a normal rhythm in people with slow heart rhythms. The device may be temporary or permanently, depending on patients' condition**.** Permanent pacemakers include patients with

myocardial infarction, persistent brady-arrhythmia, complete heart block or slow ventricular rates stemming from congenital or degenerative heart disease or cardiac surgery **(Angelidou, 2009)** and **(Olshansky and Hayes, 2015).**

Although various types of artificial pacemaker devices are available, they generally include a thin metal box or case called a pulse generator, which contains the power source producing the electrical impulses of the pacemaker. In addition, the pulse generator contains a small computer processor that can be programmed to set the rate of the pacemaker, the pattern of pacing, the energy output, and various other parameters. The pulse generator for most modern permanent pacemakers weighs one to two ounces **(Cohen *et al.*, 2012)**.

Patients undergoing permanent implantable pacemaker, challenge with multiple physical, psychological and social complications. The patients may perceive the pacemaker device as an electronic security or as a source of physical and emotional discomfort. Introducing a foreign body into the heart may cause problems in psychosocial adaptation and contribute to the development of affective disorders **(Vellone *et al.*, 2008).**

Recovery from the procedure is rapid, but there may be some restrictions on arm movement and activities for the first two to four weeks. Lead dislodgement is more common in the first few weeks after implantation. Uncommon but possible risks associated with permanent pacemaker implantation include collapsed lung (pneumothorax), infection, perforation/tamponade, and bleeding. Many devices, including those having magnetic field and security equipment at the stations can cause interference with pacemakers. Some diagnostic methods can lead to heart rhythm disorders and reduction of the device longevity **(Mlynarski *et al.*, 2009)** and **(Buellesfeld *et al.*, 2012)**.

Some of the common psychological reactions that patients with implanted pacemaker may experience are: low moods, tearfulness, sleep disturbance, irritability, anxiety, depression, acute awareness of minor somatic sensations or pain, poor concentration and memory. It should be explained to the patient that these symptoms are normal, that they are universal, and are part of the natural course of recovery following any potentially life threatening event **(Gribbin *et al.*, 2005)** and **(Gillis *et al.*, 2010).**

Although pacemaker can be associated with some complications, it is tried to return patients to their normal life within 4-6 weeks after surgery. Immediate and accurate control is effective in reducing cardiac arrhythmias, and individual's rapid return to the normal life. Teaching patients the necessary points relating to pacemaker management,

can prevent the complications. Patients' education has become an integral part of the therapeutic approach to helping patients with pacemakers. It is also integral to the promotion of self-efficacy in relation to complex treatment regimens. As well, patients' self-efficacymay lead them to the acceptance of pacemaker, adaptation with it and improve quality of their life **(Hossein *et al.*, 2010)** and **(Kirkpatrick *et al.*, 2012).**

Self-efficacy is defined as people's beliefs about their capabilities to produce designated levels of performance that influence over events affecting their lives. The beliefs determine how people feel, think, motivate themselves and behave, added to production diverse effects through: cognitive, motivation, affective and selection processes. People with high assurance in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided. In contrast, people who doubt their capabilities, away from difficult tasks which they view as personal threats **(Cheng *et al.*, 2013)**.

Self-efficacy in dealing with chronic disease reflects a capability to organize and integrate cognitive, social and behavioral skills to meet a variety of purposes. Coping with challenges posed by chronic disease requires not only knowledge and skills, but also a belief in one's ability to use those skills in realistic context and a belief that the use of the skills will produce desired outcome **(Dougherty *et al.*, 2007)**.

Counseling refers to face communication between counselor (care provider) and clients to make free and informed choice about their life and act on their choice. It is also a process through which one person helps another by purposeful conversation in understanding atmospheres. Educating patients through the counseling program should be done with the underlying assumption which is the patient with permanent pacemaker will process and understand the information received to help him adapt his life with a device **(Angelidou, 2009)**.

Significance of the study:

Pacemaker implantation saves many lives and returns patients to better health and full productive life. It impliesphysical, psychological, social and spiritual issues, even if the pacing is a complete success **(Pedersen *et al.*, 2009).** Patients with implanted cardiac devices constitute a growing segment of the contemporary healthcare practice. There are about 3 million people worldwide with pacemaker and each year 600,000 pacemakers are implanted. Taking care of such a rapidly growing patient population constitutes a challenge for all health care providers working in a cardiology ward, operating room or primary care practice **(Kanjilal *et al.*, 2014).**

Patients with pacemaker implantation were facing many problems after operation due to lack of knowledge, pre-operative preparation and post-operative management. So, those patients were suffering from direct and indirect complications, which may be related to pacemaker implantation itself, or related to profound changes in their life: physical and psychological disorders, loss of bodily function, change in personal hygiene, restrictions in social and sexual functioning impairment **(Gandhi et al., 2012).**

However, limited studies are available in Egypt about self-efficacy of permanent pacemaker patients. Hoping that, this study will help in enhancing nursing practice and research for such a group of patients.

Aim of the study:

The aim of the current study was to evaluate the effect of counseling program on knowledge and self-efficacy of patients with permanent pacemaker.

This aim was achieved through the followings:

1. Assessing patients' knowledge and self-efficacy regarding permanent implanted pacemaker.

2. Developing and implementing the counseling program for the studied patients.

3. Evaluating the effect of the counseling program on knowledge and self-efficacy of patients undergoing permanent pacemaker.

Hypotheses of the study:

The following research hypotheses were formulated to achieve the aim of the study:

1- Post implementing the counseling program, the patients' knowledge score regarding permanent implanted pacemaker will be higher than their pre implementation scores.

2- Post implementing the counseling program, patients' self-efficacy score will be higher than their pre implementation scores.

3- There will be a positive relation between patients' knowledge and their self-efficacy and psychological status.

2. Subjects and methods:

Research design:

A quasi experimental design was used to conduct this study.

Setting:

The present study was conducted in both inpatient department and outpatient clinic of cardiology which are affiliated to Ain Shams university hospital.

Subjects:

A purposive sample of 35 patients undergoing permanent pacemaker from the above mentioned settings was recruited. The sample was calculated by power and sample size calculation program to give power of 80%. Inclusion criteria were: adult patients from both gender, didn't participate in any previous educational programs regarding pacemakerand willing to participate in the study.

Tools of data collection:

The researchers utilized three tools to collect data for the purpose of this study:

1-   Patients' interviewing questionnaire: It was designed by the researchers in the light of relevant literatures, written in simple Arabic language and it is divided into three parts as follows:

A)   Demographic characteristics of the studied patients: it included age, gender, marital status, level of education, job, history of chronic disease and medical diagnosis.

B)   Patients' knowledge assessment sheet (pre/posttests): It is developed by the researchers after reviewing related recent literatures of **Tagney, (2010), Kramer et al., (2011) and Olshansky and Hayes (2015).** It was used to assess patients' knowledge related to implantable permanent pacemaker pre/post the counseling program and it included the following main items; patients' knowledge regarding physiology of the heart, artificial pacemakers (purposes & types) , pacemakers' implantation (preparation & procedure), daily living modifications, expected complications, precautions to be taken and follow up care and visits. It is consisted of 45 questions at multiple-choice form.

Scoring system:

One point was given for each correct answer and zero was given to the incorrect one with maximum possible score 45. Total scores less than 60% were considered unsatisfactory level of knowledge and that scores from 60% and more were considered satisfactory level.

C)   Indicators of counseling program success (pre and follow up tests): It is used to assess number of patients' visits to health care facilities, medical expenses and pacemaker site infection signs.

2-   Pacemaker self-efficacy questionnaire (pre/post and follow up tests): It was adapted from **Sullivan et al. (1998), Margey et al. (2010) and Wenwen et al. (2013)** and modified by the researchers to suit the aim of the current study. It was used to assess a general sense of perceived self-efficacy with the aim in mind to predict coping with daily hassles and consequences of the disease for patients with permanent pacemakers. It has 13 statements categorized under two main items: 1- control symptoms (8 statements); 2- maintain functions (5statements). Translation and retranslation from English to Arabic technique was used to ensure accuracy for content validity.

Scoring system:

Patients were asked to rate their confidence with knowing or acting relating to the 13 statements as follows: not at all confident=0, moderately

confident=1 and very confident=2. Higher scores refer to higher self-efficacy. The total score=26, whereas scores less than 50% was considered as low negative self-efficacy and scores from 50% and more was considered high positive self-efficacy

3-   Aga   khan   university   anxiety   and depression scale (pre/post and follow up tests): It was adopted from **Reza *et al,*. (1998).** The scale is an indigenously developed screening instrument that is used to assess psychiatric symptoms in the cardiac patients. The questionnaire comprises 25 questions; with 13 addressing psychological and 12 somatic symptoms such as: have you been sleeping less, have you had lack of interest in your daily activities, have you preferred to be alone, have you cried and have you felt pain all over your body?. The score of answers to each item ranged from 1-3, where 1 refer to never, 2 refer to sometimes and 3 refer to always. The total score ranged from 25-75 points, and it was categorized into score from 25-41= mild, score from 42-58 =moderate and 59-75 =severe.

Content validity and reliability:

It was ascertained by a group of experts from Medical-Surgical, Psychiatric Nursing and Public Health departments. Their opinions were elicited as regards to the tool format layout, consistency, knowledge accuracy, relevance, and competence as well the scoring system. The reliability of all study tools was tested using Cronbach's test and it range from 0.80 to 0.93. Except for, the Aga khan university anxiety and depression scale.

Ethical considerations:

In the planning phase, approval was obtained from the directors of the above mentioned settings. All patients were informed about the study aim and their rights according to medical research ethics to refuse participation and withdraw at any time without any consequences. The researchers assured maintaining anonymity and confidentiality of subject's data. Then a written consent was obtained from each patient agreed to participate in the study.

Pilot study:

A pilot study was carried out on 10% of the total study sample to test the clarity and practicability of the tools, in addition to subjects and settings. Pilot subjects were later included in the study as there were no radical modifications in the study tools.

Field work:

• Sampling and data collection were started at August 2014 and completed within six months.

• Purpose of the study was simply explained to the patients who agreed to participate in the study prior to data collection.

• The researchers started to collect data from the studied patients using the pre constructed tools.

• The researchers were available at work field to collect data for 2 days per week in the morning shift by rotation.

• The counseling program was designed based on analysis of actual patients' needs in the pre assessment using the previously mentioned tools.

The counseling program: It is consisted of four phases:

Assessment phase:

Before pacemaker implantation, the researchers interviewed the studied patients in the outpatient's clinic, individually from 10-15 minutes and explained the aim of the study. Each patient was asked to fill in the previously mentioned tools as a pretest. Each tool took 15-20 minutes to be filled in. Determining patients' needs was based on answers of patients to the tools.

Planning phase:

Counseling program booklet was designed according to relevant literatures of **Gandhi *et al.* (2012), Yarlagadda and Lange(2014) and Olshansky and Hayes (2015)**. The content was written in simple Arabic language using translation-retranslation technique to ensure its reliability and it covered the following items: Introduction about the disease process, purpose of artificial pacemaker implantation, daily life changes, diet regimen, progressing in physical activities safely, complications, precautions special concerns and follow up care.

Counseling program was delivered using the following strategies:

1-   Defining the problem: Allow patients to pinpoint specific concerns that would not ordinarily be identified such as: - difficulties in sleeping, memory and sexual functioning. – Fear from device malfunction. Questioning patients about personal concerns gives an opportunity to attain needed information and simply chat about the device.

2-   Providing information: This is one of the most the most effective methods for increasing sense of control. Patients who felt well prepared for living with the device had better physical and psychosocial efficacy.

3-   Discussing lifestyle changes: It will lead to increased confidence in self-ability in managing the device.

4-   Creating a supporting team: Social support is a significant enhancement in adjusting to implantable pacemakers.

5-   Encouraging patients to take action: By providing self-care instructions and encouraging the belief that the patients possess the capacity to care for themselves.

Implementation phase:

It has started later one-day after admission with orientation about the content of the counseling program. Individualized or small group sessions were done. The counseling program was delivered in 4 sessions with duration from 45-60 min. Content of the program was similar for all patients except for its simplicity. The booklet was handled to the studied patients at the end of the sessions. Patients were informed to be in contact with the researchers by telephone for any guidance.

Evaluation phase:

Evaluating the effect of the counseling program on the studied patients was started immediately after implementing the counseling program (posttest 1) and during the follow up periods (posttest 2) were done using the same tools of the pretest. Then a comparison between the pre/post and follow up tests was done.

Statistical analysis:

The Statistical Package for Social Science (SPSS) version 12 was used for data analysis. Data were presented using numbers, percentage, X^2 and F test. Level of significant was thresholds at $p<0.05$.

3. Results:

Concerning the demographic characteristics of the studied patients, it was observed that, 51.4% of them were females, while the age group 60 years and more constitutes the same percentage. It was revealed also that, 77.1% of the patients were married, 65.7% were illiterates and 62.9% have jobs. Regarding the medical diagnoses of the studied patients, 71.4%, 14.3% and 14.3% were diagnosed as complete heart block, incomplete heart block and atrial fibrillation respectively. As well, 42.8% of the studied patients had different history of medical diagnosis, such as, 22.9%, 20.0%, 8.6% and 5.7% had ischemic heart disease, hypertension, diabetes mellitus and renal impairment respectively.

Table (1): Clarifies patients' satisfactory knowledge about implanted permanent pacemaker management pre/post counseling program. Results revealed highly significant improvement regarding all items of the questionnaire sheet in the posttest with a p value= <0.01. The most improved items were follow up care and visits, permanent pacemaker precautions, daily living modifications and preparation with a percent score of 85.7%, 82.9%, 77.1% and 77.1% respectively.

In connection with the studied patients' self-efficacy, **table (2):** brought to the light that, 5.7%,

20.0% and 45.7% of the studied patients were very confident that they can control symptoms associated with permanent pacemaker in the pre, post and follow up tests respectively. While, regarding the efficacy of the studied patients to maintain usual functions, it was noticed that, 0.0%, 17.1% and 25.7% were very confident that they can maintain usual functions in the pre, post and follow up tests respectively. As well, 48.6% and 28.6% still not at all confident to maintain usual functions in the post and follow up tests respectively.

The same table denoted that, 8.6%, 48.6% and 65.7% of the studied patients scored total high self-efficacy in the pre, post and follow up tests respectively. While 34.3% showed low self-efficacy in the follow up test.

Table (3): revealed that there is a highly statistically significant improvement in the post and follow up tests regarding the severity of anxiety and depression among patients with implanted permanent pacemakers (p1 = 0. 001 & p2 = 0.001). It was also noticed that 11.4%, 65.7% and 74.3% of the studied patients had a mild level of anxiety and depression in the pre, post and follow up tests respectively. As well, 11.4% of the patients (4 patients) still had sever level of anxiety and depression in the post and follow up test.

Studying the correlation between patients' total satisfactory level of knowledge in relation to their total self-efficacy, anxiety and depression, **table (4)** revealed that there is a highly statistically significant correlation between the satisfactory knowledge and the self-efficacy ($p = 0.005*$). Also there is a very highly statistically significant correlation between the satisfactory knowledge and level of anxiety and depression ($p = 0.001**$). It was explained also that 91.4% and 72% of the studied patients who scored satisfactory level of knowledge in the posttest, had high self-efficacy level and mild level of anxiety or depression respectively.

Table (5): presents the percentage distribution of the studied patients as regards the indicators of counseling program success in the pre and follow up periods. It was noticed that, 57.1%, 51.4%, 40.0% and 34.3% of the studied patients had increased capacity of activity, decreased complications, decreased medical expense and decreased number of visits to health care in the follow up period respectively.

Table (1): Presentation of patients' satisfactory knowledge pre/post the counseling program (no=35)

Items of Patients' Knowledge	Pre		Post		X2	Pvalue
	No	%	No	%		
- Physiology of the heart.	6	17.1	22	62.9	10.980	<0.01*
- Artificial pacemakers (purpose & types).	4	11.4	25	71.4	17.416	<0.01*
- Pacemaker implantation (preparation & procedure).	5	14.3	27	77.1	19.517	<0.01*
- Daily living modifications.	7	20	27	77.1	19.431	<0.01*
- Expected complications.	6	17.1	22	62.9	10.980	<0.01*
- Precautions.	8	22.9	29	82.9	20.527	<0.01*
- Follow up care and visits.	5	14.3	30	85.7	20.970	<0.01*

*Significant at p<0.05

Table (2): Percentage distribution of patients in the pre, post and one month later after implementing the counseling program according to their self-efficacy (no=35)

Items	Pre		Post		Follow up		X^2_1	P_1	X^2_2	P_2
	No	%	No	%	No	%				
Control symptoms:										
- Not at all confident.	25	71.4	16	45.7	5	14.3				
- Moderately confident.	8	22.9	12	34.3	14	40	25.185	<0.001**	32.348	<0.001**
- Very confident	2	5.7	7	20.0	16	45.7				
Maintain usual functions:										
- Not at all confident.	30	85.7	17	48.6	10	28.6				
- Moderately confident.	5	14.3	12	34.3	16	45.7	19.688	<0.001**	41.112	<0.001**
- Very confident	0.0	0.0	6	17.1	9	25.7				
Total self-efficacy										
- Low self-efficacy.	32	91.4	18	51.4	10	34.3	22.158	<0.001**	36.123	<0.001**
- High self-efficacy.	3	8.6	17	48.6	25	65.7				

P1 (between pre and posttest) P2 (between post and follow up test)
*Significant at p<0.05

Table (3): Prevalence of Aga Khan University Anxiety and Depression Scale(AKUADS) scores of patient's pre / post and one month later after the counseling program (no = 35)

Degree of Aga Khan University Anxiety and Depression Scale (AKUADS).	Pre		post		Follow up	
	No	%	No	%	No	%
- Never 0 < 10	4	11.4	23	65.7	26	74.3
- Sometimes 10<20	11	31.4	8	22.9	5	14.3
- Always 20-30	20	57.1	4	11.4	4	11.4
$X^2 1 = 24.5 X^2 2 = 54.351$						
P-value1 = <0.001**; P-value 2 = <0.001**						

P1 (between pre and posttest) P2 (between post and follow up test)
*Significant at p<0.05

Table (4): Correlation between patients' satisfactory level of knowledge in relation to their self-efficacy and total anxiety and depression post implementing the counseling program (no=25)

Items	Total satisfactory level of knowledge post program (no-25)	
	No	%
Self-efficacy:		
- Low self-efficacy.	3	8.6
- High self-efficacy.	22	91.4
Test	F = 6.223; p=0.005*	
Anxiety and depression:		
- Never.	18	72.0
- Sometimes.	5	20.0
- Always.	2	8.0
Test	F = 121.624; p = <0.001**	

*Significant at p<0.05

Table (5): Number and distribution of the studied patients as regards indicators of counseling program success

Indicators	Pre		Follow up	
	No	%	No	%
DecreasedNumber of visits to health care.	7	20	12	34.3
Decreased in medical expense.	3	8.6	14	40
Decreased complications.	7	20	18	51.4
Increased capacity of activity.	5	14.2	20	57.1

4. Discussion:

Various physical, mental and social problems can negatively impact the patients' life after pacemaker implantation. There have been many reports that described problems of adjusting to life after artificial pace maker. Patients who recover from pacemakers had different healing rates and must discuss the recovery goals with the health care givers. A variety of evidence indicates that educational attainment is associated with better outcomes in patients with implanted permanent pacemakers **(Hossein *et al.,* 2010 and Kajanova *et al.,* 2014)**. The current study aimed to evaluate the effect of counseling program on knowledge and self-efficacy of patients with permanent pacemaker.

In the present study, the patients' characteristics revealed that, more than half of the patients were female and slightly more than half of them were in the age group of 60 and more. This finding was supported by **Newall *et al.* (2007)** and **Wojcicka *et al.* (2008)** who reported that permanent pacemakers most commonly implanted for older patients above the age of 60 and nearly about half of patients in his study were females. Therefore pacemaker management should be targeted at older patients with pacemakers who require more physical and mental support in adjusting to live with permanent pacemakers.

In the same context, a noticeable finding of the present study was that nearly about three quarters of the patients were married, slightly less than two thirds of them were illiterates and about two thirds of them have jobs. These findings can be explained as, the married, illiterates and working categories were common among the studied patients that elucidate the accompanying anxiety, depression and fear of not to be self-efficient after pacemaker implantation. This is congruent with **Pederson *et al.*, (2009)** and **Rahmawati *et al.*, (2013).**

Regarding history of chronic diseases, the current study revealed that one fifth of the patients had hypertension and slightly more than another fifth of the patients had ischemic heart disease. As well, less than one fifth of the patients had diabetes mellitus and renal impairment. While slightly more than two fifths had no accompanied chronic diseases. These findings may be interpreted as; the accompanied chronic diseases may enhance the complications so it is a must

to equip such group of patients with the necessary knowledge through the counseling program to be competent and prevent complications. This was harmonious with (**Kajanova *et al.,* 2014)**.

In Egypt, there are other factors that may increase susceptibility to pacemaker complications such as; Low educational level, lack of health awareness over weight, nutritional patterns and not practicing exercises.

Considering patients' satisfactory level of knowledge as regards the pacemaker care, results of this study showed significant improvement in the posttest compared to the pretest. This finding was in agreement with **Bolse, (2009)** and **Sreelekshmi (2011)** who mentioned that patients should have appropriate and adequate information before pacemaker implantation in order to avoid post pacemaker complications.

In the same line, the most improved items were that help patients to assume the daily living modifications as a result of implanting pacemakers, take precautions to prevent expected outcomes and adhere to follow up care and visits. This result asserts the assumption that meeting the educational needs of the patients would be helpful for fulfilling the obligatory changes in daily living activities. Hypothesis one was achieved through this finding. **Malm *et al.*, (2007)** and **Amin, (2008)** supported this result and mentioned that, patients with pacemaker's needs knowledge and health education about pacemaker indications, complications and coping with the new changes of life styles.

The previous finding stresses the importance of developing and implementing counseling program immediately after patients' admission to equip such a group of patients with knowledge about management of the pacemaker device.

Concerning patients' self-efficacy, results revealed significant improvement in the post and follow up assessment. A highly statistically significant difference was found between the post and follow up tests scores of self-efficacy sub-scales in controlling symptoms and maintaining usual functions ($p<0.001$). A statistically significant improvement in the post and follow up tests was detected regarding total scores of pacemaker self-efficacy ($p<0.001$) which answers the research hypothesis two.

Regarding control symptoms subscale of patients' self-efficacy, it was observed that the most significant improvement was in the follow up period, where nearly half of the patients were very confident to control symptoms like dizziness, fainting spells, palpitation, trouble catching breath, hiccups that last more than 15 minutes, chest pain, chills and fever. This finding was supported by **Boroumand (2015)** who stated that patients with permanent pacemaker would require more information regarding non-medical techniques to deal with annoying symptoms.

As for the maintaining usual functions subscale of patients' self-efficacy, it was detected that the follow up test showed the strongest functional ability as compared to the pre and posttests. In spite of that, about one third of the studied patients still not at all confident to maintain usual functions. As well the total level of self-efficacy was highly significantly improved in the follow up test more than the posttest, as detected that about two thirds of the patients showed high self-efficacy in follow up test compared to less than half in posttest.

These findings can be interpreted as, in the follow up period the healing process became nearly completed, the programming of the device became settled and patients became more familiar with the new living restrictions. Regarding to some patients still not confident to function well, this may be due to they may still anxious about their life so they prefer not to do activities and keep resting. In congruent with interpretation, **Wenwen *et al.,* (2013)** stated that such patients need more and more support to gradually return to their usual level of activity and become independent.

Allahverdipour *et al.* (2012) stated that, counseling patients with pacemaker helped in improving their health status and quality of life. He added also that counseling strengthened patients' self-efficacy perception and helped them to cope with their implanted pacemakers.

Considering anxiety and depression levels among the studied patients in relation to implantable pacemakers, it was revealed that, there is a highly significant reduction in levels of anxiety and depression in the post and follow up test compared to the pretest. A noticeable finding was that, about two thirds of the patients had a mild level of anxiety and depression in the post test. While in the follow up period, more patients their psychological status became better.

This finding may be attributed to the effect of counseling program in keeping patients in contact with the researchers. It may be also due to stressing the interpersonal communication through group discussion which made patients to ventilate their feelings and stresses aiming to help them in coping

with their life transitions. So, the promotion and maintenance of patients' social and mental health have been shown to have a positive impact on their overall health and wellbeing and play a significant role in decreasing anxiety and depression.

This result was supported by **Vellone *et al.* (2008)** and **Lampert (2013)** who explained that knowing the details of patient's abilities and difficulties, weaknesses and strengths providing the bridge by which the patient's mental, physical and social needs are met. **Cheng *et al.,* (2008)** had an incongruent, finding he found that, the prevalence of poor psychological and physical well-being and high level of depression were somewhat increasing in patients with pacemaker implantation even after post counseling intervention.

The study results declared that, there were a highly statistically correlation between patients' knowledge and self-efficacy and level of anxiety and depression post implementing the counseling program (p= <0.05 & <0.001 respectively). This result stresses the importance of patients' education in improving the physical functioning and psychological status of patients with implanted permanent pacemakers. This result was supported by **Kanjilal *et al.,* (2014).**

In connection with the indicators of counseling program success, the present study revealed that there is an obvious improvement in the follow up test compared to the pretest. This finding may be due to; the high self-efficacy has been found to reduce the number of visits to health care facilities, medical costs, and pacemaker complications and increased capacity of activity. This result was congruent with **Wenwen *et al.* (2013).**

Conclusion:

In the light of the current study, it was concluded that, the counseling program had a positive effect in improving knowledge, anxiety and depression and in turn the self-efficacy of patients with permanent implanted pacemakers. There was also a positive correlation between levels of patients' knowledge as regards their self-efficacy and level of anxiety and depression.

Recommendations:

By these results, the researchers recommended the followings:
- The counseling program should be an integral part of the total management of patients with implanted pacemakers.
- Long term effects of the counseling program should be further studied
- Education is extremely important for nurses counseling patients with implanted devices in order to play successful role as the continuous link to the

multidisciplinary professional team that guide the oftentimes forgotten humanistic care of these patients.

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