Effect of Self Care Management on Nursing-Sensitive Patients' Outcomes after Permanent Pacemaker Implantation

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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, psychosocial and emotional discomfort. So self-care management for those patients and measuring nursing sensitive patient's outcomes will lead to improve their life and overcome physical, social and psychological problems. **Aim of the study:** This study was aiming to evaluate the effect of self-care management on nursing sensitive patients' outcomes after permanent pacemaker implantation. **Study design:** A quasi experimental design was utilized to meet the aim of the study. **Subject:** A Purposive sample included 50 patients after permanent pacemaker implantation which divided into two equal matched groups' (study and control groups).**Setting:** The study was conducted at the cardiac Catheterization unit at Ain Shams University Hospital. **Data collection tools:**1) Patient's socio-demographic characteristics sheet, 2) Patient's clinical data sheet, 3) Self-care management level assessment sheet, 4) Patients' self-care practice observational checklists, and 5) Nursing Sensitive patient Outcomes Measuring Scales. **Results**: The present study revealed that satisfactory level of self-care knowledge, practice and the different levels of Nursing Sensitive patient Outcomes of patients in the study group were improved post implementation of self-care guidelines compared to control group and to pre implementation of self-care guidelines. **Conclusion:** Implementation of self-care management guidelines has positive effect on improving patient's self-care management level and enhancing all dimensions of nursing sensitive patients' outcomes (physiological health outcomes, functional health outcomes, psychosocial outcomes, health knowledge and behaviors and family health outcomes. **Recommendations** Generalize using nursing sensitive patient's outcomes based on (NOC) to provide more comprehensive standardized information on patient, family, and community outcomes that result from nursing interventions. Self-care management guidelines for patients after permanent pacemaker implantation should be applied in all cardiac catheterization units and should be updated periodically to enhance self-care management for those patients based on NOC.

Key words: Self-care management, Nursing Sensitive Patient's Outcomes, Permanent pacemaker.

Introduction

Ureteroscopy Self-care management is defined as a naturalistic decision-making process, which involves selecting behaviors that maintain physiological stability and responding to symptoms when they occur. The provision of self-care education on the need for regular physical exercise, adherence to a proper diet and medications, weight management, self-care of colds and flu, and

the management of symptoms, such as shortness of breath and fatigue, can prevent the progress of disease. Effective interventions integrate strategies that motivate, empower, and encourage patients to make informed decisions and assume responsibility for self-care (**Souza Carneiro et al., 2016**).

Self-management based on nursing-sensitive patient outcomes addresses daily management problems for patients with chronic conditions. It emphasizes three self-management tasks to regain control over daily life: take care of the medical aspects of the disease (medical management); carry out normal activities to remain socially active (role management); and manage emotional changes as a consequence of being chronically ill (emotional management). So patients are taught to deal with the physical, social and emotional consequences of being chronically ill and take responsibility in managing their chronic condition (**Xin, Xu, Ling, & Lili HUANG, 2015**).

Patients with chronic conditions make day-to-day decisions about self-manage their illnesses. This reality introduces a new chronic disease paradigm: the patient-professional partnership, involving collaborative care and self-management education. Self-management education complements traditional patient education in supporting patients to live the best possible quality of life with their chronic condition. Whereas traditional patient education offers information and technical skills, self-management education teaches problem-solving skills (**Creber, Patey, Lee, Kuan, Jurgens&Riegel, 2016**).

Patients with pacemaker implantation were facing many problems after operation due to lack of knowledge, pre-operative preparation and postoperative 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 (**Yarlagadda and Lange, 2014**).

Those patients have both psychological and physiological effects. The Physiological are associated with pain, limitation of physical activity, dyspnea, arrhythmias, and sudden death. The Psychological status is associated with anxiety, depression, changes in self- image and loss of self-esteem because these patients do not understand pacemaker implantation or show doubts regarding operations, the unhealthy psychological statuses directly influence disease development and quality of life. In addition to the physiological and psychological problems, there is an additional economic impact on both the patient and the community (**Hwang, Moser &Dracup, 2016**).

Caring of these patients requires knowledge about the device, its complications, the related factors and also the patient's hemodynamic condition, nurses' information and knowledge can be crucial and constructive in patients' training and hence the reduction of complications during the life with device. Providing nursing care and proper nursing processes for these patients can prevent complications and defects in the device performance (**HadiAtiyah, 2016**).

Negative outcomes may be averted through adherence to recommended treatment and recognizing worsening symptoms. Self-care is essential for improving quality of life for those patients. The diagnosis cardiac rhythm disorders treated with device implantation require a change of lifestyle in order to adhere to treatment. The change of lifestyle involves maintaining the efficiency of device, following prescribed diet, stress management, continuing exercise as

tolerated, recognizing symptoms, administering medications as prescribed and following-up with health providers regularly. Self-care is the sole responsibility of patients, although the support of family members and providers' provides positive reinforcement and guidance **(Creber et al., 2016).**

Significance of the study:

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 (Kirk, 2012). 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).**

Pacemaker implantation saves many lives and returns patients to better health and full productive life. It implies physical, psychological, social and spiritual issues, even if the pacing is a complete success **(Pedersen et al., 2009)**.

However in Egypt there is no national statistics available about pacemaker implant, meanwhile the medical records of cardiac outpatient clinic at Ain Shams University hospital revealed that the number of patients who had underwent Permanent pacemakers in years (2013/ 2014) were152 patients.

Aim of the Study:

This study aimed to evaluate the effect of self-care management on nursing sensitive patients' outcomes after permanent pacemaker implantation through the following:-

1- Assessing self-care management level for patients after permanent pacemaker implantation (pre intervention).

2- Developing and implementing self-care management guidelines for patients based on needs assessment.

3- Evaluating the effect of the self-care management guidelines on patients' outcomes after permanent pacemaker implantation.

Research hypothesis

The current study hypothesized that:

The self-care management guidelines will reflect positively on nursing sensitive patients' outcomes after permanent pacemaker implantation.

Subjects and Methods

A- Research design:

This study was conducted through using a quasi- experimental design.

B- Setting:

The study was conducted at cardiac Catheterization unit at Ain Shams University Hospital.

C- Subject:

A purposive sample of 50 patients after permanent pacemaker implantation will be selected according to certain inclusion criteria. The study subjects will be divided into two groups: study group who will have the self- care management & routine care and control group who will have only the routine care. The sample size was determined statistically by power analysis considering the total number of patients after permanent pacemaker implantation admitted to the Ain Shams university hospital during the year (2013/2014).With Mean±SD of age 45.37±5.76 for study group and 48.75±4.27 for control group.

- Type I error with significant level α= 99%

- Type II error by power test β= 95%

Inclusion criteria:

The study sample was selected according to the following criteria:

- Adult patients (age ≥ 18 years).

- From both sexes.

- After one month from pacemaker implantation

- With no critically or psychotic disorders.

- Able to comprehend instructions.

- Not exposed before for any educational or learning experience

- Agree to participate in the study.

D-Tools of data collection

I- **Patient's socio-demographic characteristics sheet:** It was designed by the researcher and written in simple Arabic language. It was concerned with assessment of socio-demographic characteristics of the patients under study.

II-Patient's clinical data sheet: It was designed by the researcher and written in simple Arabic language after reviewing related literatures (Collins, 2011; pellico, 2013; Hinkle & Cheever, 2014). It was concerned with assessment of patients' clinical data such as signs and symptoms on admission, past history and family history.

III-Self-care management level assessment sheet: It was designed by the

researcher and written in simple Arabic language after reviewing related literatures (**Smeltezer& Bare, 2010; Lewis et al, 2011; Morton & Fontaine, 2013; Perry, Potter &Ostendorf, 2014; and Catherine et al, 2015**) composed of 80 items to assess the patients' self-care management level. Which included Pacemaker implantation process, following PPM work, Medications, physical exercises, proper nutrition, Follow up, and Wound care and principles of maintaining the efficiency of PPM.

This tool was divided into two parts as the following:

Part 1: It was 29 items concerned with assessment of patients' knowledge regarding permanent pacemaker included Pacemaker implantation process (5 items), Following PPM work (2 items), Medications (4 items), physical exercises (3 items), proper nutrition (3 items), Follow up (6 items), Wound care (3 items) and Psychological stress (3 items).

Part 2: It was concerned with assessment of patients' level of self-care included Principles of maintaining the efficiency of PPM (14 items for men & 13 items for women), Medications (6 items), Follow up (2 items), Wound care (5 items for women & 4 items for men), Physical exercise (12 items) and Nutrition (12 items).

Scoring system

The degreeof correct answer for each statement was (1) and incorrect answer was (0). The total score of self-care management level assessment were (129) grades.

Total score was considered:

- ≥ 80% (≥ 103 grades) was satisfactory.

- < 80% (< 103 grades) was unsatisfactory.

IV-Patients' self-care practice observational checklists: It was developed by researcher and written in Arabic language based on the related literatures **(Judith & Joan,2013; Morton & Fontaine, 2013 and perry, Potter &Ostendorf, 2014)** to assess patients' ability to perform skills related to self-care which were important to prevent and detect complications. The response of each procedure was divided into (done correctly, done incorrectly and not done). The observational checklists were composed of four self-care skills including breathing exercises (9 items), pulse measurements (5 items), physical exercises (7 items) and relaxation techniques (10 items).

Scoring system:

The total score of patients' self-care practice observational checklists was (31) grades, one grade was given to the step which was done correctly and zero to the step which was done incorrectly or not done. Total score was considered as the following:

- $\geq$ 90% ($\geq$ 28 grades) was considered satisfactory level of self-care practice.

- < 90% (< 28 grades) was considered unsatisfactory level of self-care practice.

V-Nursing Sensitive patient Outcomes Measuring Scales:it was adapted from **Moorhead, Johnson, Maas & Swanson, (2008).** It was modified by the researcher written in English language (guided by Nursing Outcome Classification System developed by Iowa University Project). It was used to measure nursing sensitive outcomes related to different aspects of patient care covering biopsychosocio- educational dimensions

Scoring system

A three- point likert scale is used with all outcomes and indicator to measure patient status. Each item had three responses ranging from 1-3; a rating of a '3' is always the best possible score and '1' is always the worst possible score.

Tools validity and reliability

To achieve the criteria of trustworthiness of the tools of data collection in this study, the tools were tested and evaluated for their face and content validity by seven expertise from faculty members in the medical surgical nursing field from Faculty of Nursing, Ain Shams University. They were from different academic categories, i.e., two professors, four assistant professors and one lecturer. To determine relevance, clarity, and completeness, simplicity and applicability of the study tools, expertise elicited responses were either agreed or disagreed or agreed with modifications for the face validity and for content reliability. About 85% or more of the experts were agreed on the proposed tool. Required modifications were done. The modifications were focused on some Self-care management level assessment questionnaire sheet. Testing reliability of the proposed tools was done statistically by Alpha Cronbachtest.

- **Pilot Study:**

Testing for the selected tools was carried out before starting the data collection. It was done on a group of 10 patients to test the applicability of the tools.

Field Work:

Field work included two phases: implementation phase and evaluation phase.

I- Implementation phase

- This phase started by selecting patients after permanent pacemaker implantation who met the inclusion criteria and explaining simply the aim and nature of

the study as well as taking their approval to participate in the study prior to data collection.

- The patients' telephone numbers were obtained at the first time for contacting them to determine the other appointments in order to complete data collection process.

- Patients were randomly assigned into two matched equal groups (control and study). Control group was recruited first from cardiac catheterization unit and exposed to the routine hospital nursing intervention, while study group was recruited later during their follow up and not exposed to previous or other educational program.

- The Patient's socio-demographic characteristics sheet, Patient's clinical data sheet and self-care management level assessment sheet were used to assess patients' medical history and patient self-care level to correct accordingly. These tools were filled in by the researcher or by patients for each patient according to their level of education; it had taken about 30-45 minutes to be filled in for every patient.

- Patients were observed by the researcher using observational checklists to assess their self-care practice regarding breathing exercises, pulse measurements, physical exercises and relaxation techniques. It had taken 20 minutes for every patient.

- Patients were observed by the researcher using observational checklists to assess their self-care practice regarding breathing exercises, pulse measurements, physical exercises and relaxation techniques. It had taken 20 minutes for every patient. The Nursing Sensitive patient Outcomes Measuring Scales were filled in by the

researcher. It had taken 30 minutes for every patient.

- Based on patients' learning needs, the researcher developed the self-care guidelines in Arabic language including the following contents: conduction system of the heart, permanent pacemaker implantation process, flow up schedule, principles of follow up permanent pacemaker function, exercise and stress management strategies for patients after permanent pacemaker implantation.

- The self-care guidelines were carried out at the cardiac catheterization unit over two days for every 2 to 3 patients together according to their level of education and understanding. The self-care guidelines were conducted through small group discussion, role play, and demonstration, supported by using posters and booklet.

- Data collections teaching sessions for the sample of this study took about 10 months were conducted in morning and afternoon shifts started from September 2015 until June 2016.

II- Evaluation phase:

Post implementation of the self-care guidelines, all tools except Patient's clinical data sheet were refilled in again after 3 months. Evaluations the effect of self-care management on Nursing Sensitive patient Outcomes was done by comparing the results pre and post the implementation of the self-care guidelines by using the same data collection tools which were done to control and study groups after 3 months.

Administrative Design:

An official letter was issued from the Faculty of Nursing, Ain Shams University to the director of Ain shams university hospital

at which the study was conducted, explaining the purpose of the study to obtain their permission to conduct this study.

Ethical Considerations:

- The research approval was obtained from the ethical committee of faculty of nursing before initiating the study work.

- The researcher clarified the objectives and aim of the study to patients included in the study.

- Patients' oral consent to participate in the study was obtained.

- The researcher assured maintaining anonymity and confidentiality of subjects` data.

- Patients were informed that they are allowed to withdraw from the study at any time without giving any reasons and without penalties.

Statistical Design:

The data were collected, coded and entered into a suitable excel sheet. Data were transferred into SPSS version (17). Quantitative data were presented as mean, standard deviation; comparison was done using X2 test. Qualitative data were presented as percentages. The observed differences and association were considered as follows:

- ♦ Non-significant at P > 0.05

- ♦ Significant at P ≤ 0.05

- ♦ Highly significant at P < 0.001

Limitation of the study

1- The time available for data collection during the follow up was not enough, as most of patients come from far towns and need to leave hospital as early as possible.

2- The literacy and lack of reading skills limited the ability of patients to access and use written information. So, the researcher depended on assistive personnel or caregiver to provide this information for them.

Results

Table (1) shows that,regarding socio-demographic characteristics of the study and control groups, mean age of the study group was 45.37 ± 5.76 while the mean age of control group was 48.75 ± 4.27. Regarding patients' gender, it was found that, 76% of patients of the study group were males, while 60% of the patients in control group were males. In relation to marital status according the study and control groups, it was found that 76% and 64 % study and control groups respectively of patients in the both groups were married.

Table (2) showed that, regarding satisfactory level of knowledge about permanent pacemaker, there was no statistical significant difference between number of patients who have satisfactory level of knowledge pre implementation of self-care guidelines about pacemaker implantation operation, following pacemaker work, medications, physical activities allowed, proper nutrition, wound care and stress management on the both groups. Concerning level of knowledge about these items post the implementation of self-care guidelines there was a highly statistically significant difference between study and control groups regarding the all items (p<0.001).

Table (3) illustrated that, the satisfactory level of self-care practices regarding breathing exercise, pulse measurement, physical exercises and

relaxation technique showed no statistically significant differences between the both groups pre self-care guidelines implementation. While, there was a highly significant difference between the study and control groups regarding self-care practices post implementation of the self-care guidelines (<p 0.001).

Table (4)reveled that, different levels of nursing sensitive patient outcomes regarding physiological outcomes, functional outcomes, psychosocial outcomes, health knowledge and behaviors and family health outcomes of patients in the study group were improved post implementation of the self-care guidelines with a statistically significant differences between them regarding physiological health outcomes and functional health outcomes (P value was **0.033** and **0.047** respectively) and with a highly

statistically significant differences between two phases regarding psychosocial outcomes, health knowledge and behaviors and family health outcomes (P<0.001).

Table (5)reveled that, there were highly statistically significant differences between number of patients in the study group regarding their total practice and total Nursing Sensitive patient Outcomes post implementation of self-care guidelines (P<0.001).

Table (6)showed that, there were statistically significant positive correlation between patients' total self-care knowledge and total practice with their nursing sensitive patient outcomes in the study and control groups pre and post implementation of self-care guidelines (P<0.001).

Table (1): Number and percentage distribution of the study and control groups according to their socio-demographic characteristics:

Items	Groups				Chi-square		
	Study (n=25)		Control (n=25)				
	N	%	N	%	X2	P-value	
Age							
20 = <40	14	56	6	24	4.828	0.089	
40= <50	3	12	10	40			
>= 50	8	32	9	36			NS
Mean±SD	45.37±5.76		48.75±4.27				
Gender							
Male	19	76	15	60	0.325	0.569	
Female	6	24	10	40			NS
Marital status							
Married	19	76	16	64	6.210	0.102	NS
Single	5	20	2	8			
Widow/ Divorced	1	4	7	28			
Level of education							
Illiterate	13	52	18	72	3.552	0.314	
Read/ Write	9	36	5	20			NS
High education	3	12	2	8			
Residence							
Rural	18	72	16	64	0.368	0.544	
Urban	7	28	9	36			NS
Living status							
Alone	8	32	6	24	0.397	0.529	
Live with The family	17	68	19	76			NS
Job							
Require Mental effort	6	24	10	40	4.286	0.117	
Require muscular effort	14	56	7	28			NS
Usual housing work	5	20	8	32			
Income according to patient's opinion							
enough	9	36	7	28	0.764	0.382	
Not enough	16	64	18	72			NS

Not Significant (NS) P>0.05

Table (2):Comparison between the study and control groups regarding their satisfactory level of knowledge about permanent Pacemaker pre and post implementation of self-care guidelines

Items of knowledge	Satisfactory level of knowledge											
	Pre						post					
	Study (n=25)		Control (n=25)		X^2	P-value	Study (n=25)		Control (n=25)		X^2	P-value
	N	%	N	%			N	%	N	%		
Pacemaker implantation operation	0	0.0	0	0.0	-	NA	15	60.0	4	16.0	5.195	0.023* S
following pacemaker work	0	0.0	1	4	1.020	0.312 NS	14	56.0	0	0.0	19.444	<0.001** HS
Medications	1	4	2	8	0.315	0.575 NS	9	36.0	1	4.0	22.222	<0.001** HS
Physical activities allowed	3	12	2	8	0.222	0.637 NS	16	64.0	0	0.0	25.758	<0.001** HS
Proper nutrition	1	4	0	0.0	1.020	0.312 NS	17	68.0	5	20.0	11.688	<0.001** HS
Follow up visits	5	20	0	0.0	5.556	0.018* S	21	84.0	5	20.0	20.513	<0.001** HS
Wound care	2	8	3	12	3.191	0.074 NS	18	72.0	3	12.0	18.473	<0.001** HS
Stress management	1	4	0	0.0	1.020	0.312 NS	15	60	0	0.0	21.429	<0.001** HS

 Not Significant (NS) P>0.05   *P ≤ 0.05 Significant (S)   *P ≤ 0.01 Highly Significant (HS)

Table (3): Comparison between study and control groups regarding their satisfactory level of self-care practices pre and post implementation of self-care guidelines

Items of self-carepractice	Satisfactory level of self-carepractice											
	Pre						Post					
	Study (n=25)		Control (n=25)		X^2	P-value	Study (n=25)		Control (n=25)		X^2	P-value
	N	%	N	%			N	%	N	%		
breathing exercise	1	4	0	0.0	1.020	0.312 NS	15	60	0	0.0	21.429	<0.001* HS
pulse measurement	2	8	0	0.0	2.083	0.149 NS	21	84	0	0.0	29.066	<0.001* HS
Physical exercises	0	0.0	0	0.0	-	NA	16	64	0	0.0	23.529	<0.001* HS
relaxation technique	0	0.0	0	0.0	-	NA	19	76	0	0.0	30.645	<0.001* HS

Not Significant (NS) P>0.05   NA: Not applicable   *P ≤ 0.01 Highly Significant (HS)

Table (4): Comparison between levels of Nursing Sensitive patient Outcomes among patients of study group pre and post implementation of self-care guidelines

Items of nursing sensitive patient outcomes		Level of nursing sensitive patient outcomes					
		Study (n=25)					
		pre		post		Chi-square	
		N	%	N	%	X2	P-value
Physiological health outcomes	mildly	6	24	12	48	6.794	0.033*
	moderately	8	32	10	40		S
	extremely	11	44	3	12		
Functional health outcomes	mildly	9	36	17	68	6.098	0.047*
	moderately	14	56	8	32		S
	extremely	2	8	0	0		
Psychosocial outcomes	mildly	0	0	18	72	29.259	<0.001**
	moderately	20	80	7	28		HS
	extremely	5	20	0	0		
Health knowledge and behaviors	mildly	0	0	15	60	23.867	<0.001**
	moderately	12	48	8	32		HS
	extremely	13	52	2	8		
Family health outcomes	mildly	3	12	15	60	19.532	<0.001**
	moderately	4	16	7	28		HS
	extremely	18	72	3	12		

*$P \leq 0.05$ Significant (S)   **$P \leq 0.01$ highly Significant (HS)

Table (5):Relation between patients' total practice and total Nursing Sensitive patient Outcomes post implementation of self-care guidelines for the study group (N = 25).

Total Outcomes	Total practice							
	Satisfactory		Unsatisfactory		Total		Chi-square	
	N	%	N	%	N	%	X2	P-value
Mildly	15	60.0	0	0.0	15	60.0	18.435	<0.001*
Moderately	2	8.0	5	20.0	7	28.0		HS
Extremely	0	0.0	3	12.0	3	12.0		
Total	17	68.0	8	32.0	25	100.0		

*$P \leq 0.01$ Highly Significant (HS)

Table (6):correlation between patients' total Nursing Sensitive patient Outcomes, total self-care level and total practice in the study and control groups pre and post implementation of self-care guidelines.

Items	Total outcomes							
	Study (n=25)				control (n=25)			
	Pre		post		pre		post	
	R	p-value	r	p-value	r	p-value	r	p-value
Total self-care level	0.736	0.00* S	0.899	<0.001** HS	**0.677**	0.00* S	0.677	0.00* S
Total practice	0.594	*0.00 S	0.781	<0.001** HS	0.985	<0.001** HS	0.392	0.03 NS

Not Significant (NS) P>0.05   *$P \leq 0.05$ Significant (S)   **$P \leq 0.01$ highly Significant (HS)

Discussion

Concerning patients' demographic characteristics, the results of the present study revealed that, the mean age of the study group was 45.37±5.76 while the mean age of control group was 48.75±4.27;with a non-significant difference between them, these results are in agreement with **Youssef (2014)** who mentioned that, the mean age of the patients with Permanent Artificial Pacemaker in their study was 43.48±13.24. In recent years, the proportion of patients undergoing permanent pacemaker implantation around the age of 40 years has increased. It can be explained by increased incidence of cardiac diseases and recurrent exposure to life stressors in younger adults which is a critical indicator, this opinion is in consistent with what was reported by **Khawaja et al (2011)**who reported a significant increases in incidence of PPM implantation over 30 years.

As regards gender, the present study result clarified that the male patients were more than three quarters in study group and more than half of the control group. This result is in congruent with **Figueroa, Alcocer& Ramos (2016); and Youssef (2014)** who mentioned that more than more than half of the study subjects were males. This finding may be due to that heart diseases and hypertension are more prevalent in males than females , as well as men are significantly more likely to more stress from heavy physical activities or actions than women with more limited ways to express emotional stress in the workplace than women as crying which is more socially acceptable for women than men that relieves stress, this opinion is supported by **Smith (2015)**who appeared that, men's coping with stressful events may be less adaptive physiologically, behaviorally, and emotionally, contributing to their increased risk for chronic heart diseases.

Concerning marital status, the results showed that, more than three quarters of the patients in study group were married and slightly less than two thirds of them in the controls); this may reflect that married people were liable to cardiac diseases more than singles because they always facing psychological stress of the social role. This result is congruent with **Mohamed & Mohamed (2014)** who mentioned that the majority of their study subjects were married; moreover **Nasr, El Ganzory& Ahmed (2015)** found that, nearly about three quarters of the patients under their study were married.

One of the noticeable findings of the study was that, more than half of the patients in study group were illiterate and slightly less than three quarters of the control group were illiterate. This finding is in consistent with what was reported by **Nasr, El Ganzory& Ahmed (2015)** who revealed that slightly less than two thirds of their study patients were illiterates. These findings may be represent, the low social standard for patients attending at Ain Shams University hospital as a governmental hospital for getting medical treatment. Moreover as evidenced by their report about their income that is not enough.

Regarding residence, the current study showed that less than three quarters of the patients in study group; as well as slightly less than two thirds of the control group were from rural areas and their family income not enough for the costs of treatment. These findings may be interpreted as unavailability of specialized hospitals affording pacemaker insertion in rural areas. On the other hand, **Eldriny(2012)** proved that, more than half of his study subjects were from urban area.

Concerning job, more than half of the patients of study group their jobs required muscular effort compared to less than one third of the controls. This finding can be explained as, most of these patients had labor work, this finding is supported by

Rahmawati et al., (2013); and Starrenburg et al., (2014). Regarding their monthly income adequacy less than three quarters of the patients had low income. This may be due to the changes of their work abilities and increase their daily living finance.

Considering patients' satisfactory level of knowledge as regards the PPM care, results of this study showed significant improvement in the posttest after implementation of self-care management guidelines compared to the pretest. This finding was in correspondence with **Youssef (2014)** who mentioned thatpatients knowledge regarding PPM pre implementation of educational program was unsatisfactory in both two groups while, there were improvements with highly statistically significant differences between them post implementation of educational program.

Furthermore, this finding may be attributed to the effect of the provision of educational booklet with clear and simple written information which given to them. In addition the curiosity of the study subjects to know how to deal with permanent pacemaker make them more satisfied with information given to them about their diagnosis when compared with the control group. This opinion was supported with **Bolse, (2009) and Sreelekshmi (2011)** who mentioned that patients with pacemaker's needs knowledge and health education about pacemaker indications, complications and coping with the new changes of life styles

In the same line, the most improved items were that help patients to assume the physical activities as a result of implanting pacemakers, take precautions to prevent expected outcomes in order to avoid post pacemaker complications 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. In this view, **Ramadan (2011), and Sadek (2012)**reported that patients could retain their new knowledge long as six months after the educational program and the changes in the patients' behavior take long time.

Regarding satisfactory level of self-care practices the current study denoted higher statistically significant differences between patient's practices scores pre and post implementation of self-care management guidelines related to breathing exercise, pulse measurement, physical exercises and relaxation techniques. The majority of study subjects had higher post total practice scores as the study group was better compared to the controls. However, all the studied subjects had an unsatisfactory practice scores before receiving the designed self-care guidelines. These findings may be as a result of continuous demonstration, re demonstration, follow up and practical content of the instructional booklet which was given to the studied subjects with the continuous explanations, reinforcement and feedback.

In the same context, this finding is supported by **Shahrbabaki, Nouhi, Kazemi&Ahmadi (2016)** and**Refaii (2010)** reported that the improvement level of the study group in practice scores post implementation of educational program as compared to control group with highly statistically significant differences between the two groups during the post assessment. Moreover this study is consistent with **Zafari, Ghadrdoost, Hanifi, &Khaleghparast (2012)** who reported that learning leads to increase the awareness and change self-care performance behaviors that increased in experimental group in 1 to 3months after performing the learning program and has improved life quality.

Concerning nursing sensitive patient outcomes before implementation of self-care guidelines, more than three fourths of study and control groups displayed between

moderately and extremely compromised physiological health, also, more than half of study and majority of control showed moderate level of compromisation of functional health, in addition, the majority of both group revealed moderate psychosocial compromisation, while all of them displayed moderate and extreme compromisation as regard health knowledge and behavior, finally, family health outcomes showed moderately and extreme compromisation especially at the controls with a non-significant difference between both groups. These finding may be referred to lack of education and improper communication between patients and health care providers.

After implantation of self-care guidelines, the findings of the present study displayed highly statistically significant differences between study and control groups regarding all aspects of health outcomes, in addition to a statistically significant improvement of the all health outcomes among study group patients compared to their baseline assessment before implementation of self-care guidelines. These findings can be explained as after exposing study group for self-care guidelines, their self-care knowledge and practice improved which affected positively on their nursing sensitive patient outcomes.

Regarding **physiological health outcomes** the current study revealed that study group's physiological outcomes were improved post implementation of self-care guidelines with a statistically significant differencebetween two phases. This finding may be attributed to the effect of assuming the daily living modifications as a result of implanting pacemakers take precautions to prevent expected outcomes and adhere to follow up care and visits which improve physiological outcomes associated with arrhythmia and implanted pacemaker. This result asserts the assumption by **Kanjilal (2014)** that meeting the educational needs of the patients improving the physical

functioning of patients with implanted permanent pacemakers.

In accordance with the study findings, **Berg, Støier, Moons, Zwisler, Winkel& Pedersen (2015)**illustrated that patients suffered from arrhythmia disorders associated with pacemaker implantation had many physiological changes as decreased cardiac output, shortness of breath (exertional dyspnea), decreased arterial pressure can result in syncope, fainting, other symptoms related to hypotension and increased myocardial oxygen demand can cause angina (chest pain) which can be controlled by educating patients with pacemaker that might help in improving their health status and quality of life. On this regards **Dake& Dias (2014)** concluded that, information booklet regarding home care of pacemaker was effective among the patients with complete heart block.

Concerning **functional health outcomes** the current study detected that the study group's functional ability were improved post implementation of self-care guidelines compared to the pre test with a statistically significant difference between two phases. 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 taught in educational sessions. These interpretation supported by **Hasian, Gersha&Hamdi (2009)** through study for investigation of the effectiveness of the nursing intervention in patients undergoing pacemaker implantation is done through the comparing hemodynamic measurement before and after exercises, illustrated that there were increase in ventricular pacemaker rates during exercise has shown improved hemodynamic and exercise tolerance.

One of the noticeable findings of the study regarding **psychosocial outcomes** was

that there was highly significant improvement of psychological status post guidelines evaluation compared to the pre guidelines evaluation. This finding may be attributed to stressing the interpersonal communication through group discussion which made patients ventilate their feelings and stressors aiming to help them in coping with their life transitions. This finding supported by **Nasr, El Ganzory& Ahmed (2015)** who concluded that patients who received nursing intervention demonstrated improvement in their psychological status than patients in the control group.

As regards **health knowledge and behaviors** the current study presented that study group's health knowledge and behaviors were improved post implementation of self-care guidelines with a highly statistically significant difference between two phases. This may be due to empower of their knowledge and skills with essential information related to PPM, allowed activity and suitable sports, importance of ID and also of regular follow-up care with determination of signs and symptoms of pacemaker failure and complications could be lifesaving and very essential to help them lead a relatively normal life without or with minimal complications. This finding was in consistence with **Abbasi, Negarandeh, Norouzadeh & Mogadam (2016)** who reported that those patients should have appropriate and adequate information after pacemaker implantation in order to avoid post pacemaker complications.

Concerning **family health outcomes** the current study showed that study group's relatives their knowledge and behaviors were improved post implementation of self-care guidelines with a highly statistically significant difference between two phases. These findings may be interpreted as; the patients relatives need support and understanding the nature of pacemaker device and how to deal with it due to the short hospitalization period that make them

in a state of high demands to understand the situation and low control to handle it at home. So that, educational program increased their awareness, knowledge and coping with their patient's condition. This finding supported by **Malm & Sandgren (2014)** who concluded that the relatives have an important role when the patient has a life threatening condition, such as cardiac arrest, through their presence increasing the patient's feeling of strength and support that gained by education. This means that the relatives have an important task also so that they will function as a relative and be able to regain normalcy.

In relation to total self-care level, practice and nursing sensitive patient outcomes post implementation of self-care guidelines the current study results declared that, there were highly statistically significant differences between number of patients regarding their total self-care level, practice and nursing sensitive patient outcomes on both groups with obviously improvement in study group post implementation of self-care guidelines. These findings may be attributed to the effect of self-care management guidelines which affected positively on changing patients knowledge, practice and outcomes. These findings is in correspondence with **Nasr, El Ganzory& Ahmed (2015)** who approved that, the counseling program had a positive effect in improving knowledge, psychological status and in turn the self-care of patients with permanent implanted pacemakers.

By studying the relation between patients' total self-care level and total practice post implementation of self-care guidelines for the study group, the current study revealed that, there were highly statistically significant differences between number of patients of study group regarding their total self-care level and total practice post implementation of self-care guidelines.The researchers' opinion is that, this relation may be due to increasing the people awareness by

increasing their self-care knowledge level which affected positively on practice level and may be expected that patients with higher self-care management level should have better practice toward his disease and therefore be more compliant.

Regarding to correlation between patients' total nursing sensitive patient outcomes, total self-care knowledge and total practice in the study and control groups pre and post implementation of self-care guidelines. The present study showed that there were statistically significant positive correlation between patients' total self-care knowledge and total practice with their nursing sensitive patient outcomes in study and control groups. From the researcher point of view this could be contributed to the fact that higher self-care management level should have better health outcomes in patients with PPM. This result is in the same line with **Wenwen et al., (2013)** who reported that there was a significant statistical positive correlation between total knowledge and total practices scores among the study and control group subjects throughout the different assessment periods in their study.

Conclusion

The results of this study concluded that:

- Implementation of self-care management guidelines has positive effect on improving patient's self-care management level and enhancing all dimensions nursing sensitive patients' outcomes (physiological health outcomes, functional health outcomes, psychosocial outcomes, health knowledge and behaviors and family health outcomesafter permanent pacemaker implantation.

Recommendations

Based upon the findings of this study, the following recommendations were made:

- Replication of the current study on a larger probability sample is recommended to achieve generalization of the results and wider utilization of the designed self-care management guidelines.

- Studying the possible strategies to generalize using nursing sensitive patients outcomes based on nursing outcomes classifications (NOC) to provide more comprehensive standardized information on patient, family, and community outcomes that results from nursing interventions.

- Inclusion of NOC in nursing curricula to be utilized by nursing students in clinical education as a continuum for nursing diagnosis classification.

- Establishment of an in-service training center that could include data base about such group of patients and provide them with all needed information

- Self-care management guidelines for patients after permanent pacemaker implantation should be applied in all cardiac catheterization units and should be updated periodically to enhance self-care management for those patients based on NOC.

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