

## Nurses Role Regarding the Care of Patients with Permanent Pacemaker

Asmaa Mohamed Ahmed <sup>(1)</sup>, Nadia Mohamed Taha <sup>(2)</sup>, Howida Kameel Zytoon <sup>(3)</sup>  
Mona Abdallah Mohammed <sup>(4)</sup>

<sup>(1)</sup> B.Sc. Nursing, Faculty of Nursing, Zagazig University. <sup>(2)</sup> Professor of Medical Surgical Nursing, Faculty of Nursing, Zagazig University. <sup>(3)</sup> Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Zagazig University & <sup>(4)</sup> Lecturer of Medical Surgical Nursing, Faculty of Nursing, Zagazig University

### Abstract

**Background:** Sudden cardiac death is one of the most common reasons of death worldwide which is prevented by inserting a pacemaker. Pacemaker is an electronic device that placed under the skin of the chest to help control abnormal heart rhythms by conducts electrical stimuli to the heart muscle. **Aim of the study:** To assess nurses' role regarding the care of patients with permanent pacemaker. **Subjects and Methods: Research design:** A descriptive exploratory design was utilized. **Setting:** The study was conducted in all cardiac care units at Zagazig University Hospitals **Subjects:** A convenient sample of all available nurses (60). **Tools of data collection:** Two tools were used to collect the study data: Self-administered questionnaire about personal characteristics of study nurses and nurses' knowledge. An observational checklist to assess nurses' practice. **Results:** Four fifth (80.0%) of the studied nurses had unsatisfactory level of total knowledge regarding care of patients with permanent pacemaker. The most (90.0%) of studied nurses had unsatisfactory level of total practice regarding care for patients with permanent pacemaker. **Conclusion:** Most of studied nurses had unsatisfactory level of performance (knowledge and practice) regarding care of patients with permanent pacemaker .There was statistically significant relation between total nurses' knowledge and practice regarding care of patients with permanent pacemaker . **Recommendation:** The training programs are highly recommended to improve nurse's knowledge and practice regarding the care of patients with permanent pacemaker.

**Keywords:** Nurses Role, Permanent Pacemaker, Patients Care.

### Introduction

Cardiac stimulation has become the common treatment of symptomatic bradycardia or high-grade atrioventricular block. Pacemaker implant rates have increased exponentially in the last few years. The technological advances of these devices and the growing number of clinical indications are the main factors that contribute to the increase of this rate. Each year 1.25 million permanent pacemakers are implanted worldwide <sup>(1)</sup>.

The conducting system of the heart is a specialized network of electrical pathways consists of sino atrial node, atrioventricular node, AV bundle and Purkinje fibers that are specialized for producing and conducting impulses rapidly through the heart. The conducting system of the heart initiates the normal cardiac cycle and regulates the contractions of cardiac chambers. The conducting system initiates normal

cardiac cycle and regulates the contraction of cardiac chambers. The conducting system provides the heart with automatic rhythmic beat necessary for the heart pump action. Irregularities in the normal cardiac conduction system can cause cardiac arrhythmias and bradycardia <sup>(2)</sup>.

One of the most serious cardiovascular problems is cardiac rhythm disorder. During an arrhythmia, the heart may beat too rapidly, too slow, or with irregular heart rhythm. Most arrhythmias are harmless, but some can be severe or life threatening .Dysrhythmias impairs the heart's capacity to pump a sufficient amount of blood and oxygen. This decreased oxygenation is responsible for the signs and symptoms associated with arrhythmias. These signs and symptoms are severe or present

regularly, the patient may likely feel significant pain and disruption in their daily life, a pacemaker will be required to help the heart beat normally and preserve patient health <sup>(3)</sup>.

Pacemaker is a small device that allows more regularly heart beats, which use the electric impulses delivered by the electrodes that sense intrinsic heart rhythm and provide electric stimulation when indicated. Permanent pacemaker mainly placed under the skin on chest, just under collarbone. Permanent pacemaker electrically stimulates myocardium layer of heart to depolarize or induce a contraction, when heart's SA node isn't functioning properly, and mainly used to control long-term heart rhythm disorder <sup>(4)</sup>.

Caring for patients with permanent pacemaker requires knowledge about the device, its complications, and the related factors and also patient's hemodynamic state, nurse's knowledge can be crucial and constructive in patient's training and enhance the reduction of complications during the life with the device. Providing nursing care and proper nursing process for these patients can prevent complications and defects in the device <sup>(5)</sup>.

### Significance of the study:

Worldwide sudden cardiac death is the cause of up to 450000 deaths around the world each year. The SCD is usually caused by an unstable, fast ventricular rhythm, ventricular tachycardia and ventricular fibrillation which controlled by implementation of permanent pacemaker that maintains regular heart beats. Caring for patients with permanent pacemakers needs knowledge and practice about the device and its risks and guidelines for homecare and long term follow up. Optimum outcome can be only achieved after permanent pacemaker implementation, provided that patients are supported in compliance to a lifelong with permanent pacemaker <sup>(6)</sup>. So, the current study was carried out to

assess nurse's role regarding care for patients with permanent pacemaker.

### Aim of the study:

This study aimed to assess nurses role regarding the care of patients with permanent pacemaker through the following objectives:

- Assess nurses' level of knowledge regarding the care of patients with permanent pacemaker.
- Assess nurses' practice regarding the care of patients with permanent pacemaker.

### Operational definition:

**Role:** The term role refers to the act of carrying out or doing. It is an execution, accomplishment or achievement. For the purpose of this study, the term means knowledge and practice of the nurse at cardiac intensive care units.

**Care:** It is the health care services (Nursing Care) provided by nurses that meet patients' physical, psychological and spiritual needs, and also meets the professional standards.

### Research Questions:

1. What are the nurses' levels of knowledge regarding the care of patients with permanent pacemaker?
2. What is the level of nurses' practice regarding the care of patients with permanent pacemaker?

### Subjects and methods:

#### Research design:

A descriptive exploratory design was used.

Descriptive research is usually defined as a type of quantitative research, though qualitative research can also be used for descriptive purposes. The research design should be carefully developed to ensure that the results are valid and reliable. Descriptive research is an appropriate choice when the research aim is to identify characteristics, frequencies, trends, and categories j`1(7).

**Study setting:**

The present study was conducted in all CICUs (cardiac care unit at internal medical hospital located in the first floor consisted of two rooms each room contains five beds, free cardiac care unit located in second floor contains 10 beds, and cardiac care unit with agar located in third floor contains of 10 beds at cardiothoracic hospital) at Zagazig university hospitals, Zagazig Governate, Egypt.

**Study subjects:**

A convenient sample of all available nurses (60) working in all cardiac intensive care units at Zagazig university hospital, Zagazig Governate, Egypt.

**Tools of data collection:**

Two tools were used to collect necessary data. **Tool I: Self-administered questionnaire:** Composed of two parts:

**Part (1):** used to assess demographic characteristics as: age, gender, jobs, years of experience, level of education, marital status, attendance in training courses, income and residence <sup>(5)</sup> (9 closed ended questions).

**Part (2):** used to assess nurses knowledge regarding the care of patients with permanent pacemaker including four different sections (anatomy and physiology of the heart, investigation, pacemaker<sup>(8)</sup> and nursing care before insertion<sup>(9)</sup> and nursing care after insertion of permanent pacemaker<sup>(8,10)</sup>. (47 MCQ & True and False questions). It was adapted and modified by the researcher from (Kerry,2010) & (Mohammed, et al.,2020) and (McLaughlin, 2015) .

**Scoring system:** The total score of the knowledge was 47 grades (100%). Each complete correct answer scored one grade, zero for incorrect answer. For each area of knowledge, the score of the items was summed-up and the total divided by the number

of the items, giving a mean score for the part. These scores were converted into percent scores. Knowledge was considered satisfactory if the percent score was equal or above 70% and unsatisfactory if less than 70% based on statistical analysis.

**Tool II- Observational checklists for nurses**

It was used to assess level of nurses' practices regarding the care of patients with permanent pacemaker. Attenuated observational checklist was developed by the researcher. It consisted of four parts (vital signs(52 items), caring for closed wound(26 items) <sup>(11)</sup>, ECG(14 items) <sup>(8)</sup>, and pre and post caring for permanent pacemaker <sup>(8,9,10)</sup> (33items).In observational checklist each items was given score one done correctly step and score zero for not done or done in correctly, the scores of the items were summed-up and the total divided by the number of the items, giving a mean score for the part. These scores were converted into percent scores. The nurses had satisfactory level of practice when the total score equal or above 70% and unsatisfactory if it below 70% based on statistical analysis.

**Content validity& Reliability:**

The tools were revised by a panel of seven experts from nursing staff which included professor, two assistant professors and four lectures of medical surgical nursing that revised the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation. All recommended modifications were done. Reliability was measured by Alph Cronbach for knowledge questionnaire was 0.885. Reliability of practice checklist was 0.955.

**Fieldwork**

Once the approval was granted to progress in the study, the researcher started to organize a schedule for collecting the data. The researcher visited study setting to be familiar with work process, time of work and observe nurses attending the study settings to a set schedule for data collection. The researcher used to go to the study setting for interviewing the nurses. The purpose of the study was explained to each nurse individually, and then the nurses were asked to participate in the study.

Each nurse observed for 2 shifts at morning and afternoon for three times then she asked to fulfill the questionnaire. As the researcher was observing nurses practical skills about studied procedure. The time needed to complete the checklist varies between 30-45 minutes and 30 - 40 minutes to fulfill the questionnaire. The fieldwork was executed over the period October, 2020 to March, 2021. The researcher was available 2 days at Zagazig University hospital.

#### **Pilot study:**

A pilot study for tools of data collection was carried out in order to check and ensure the clarity, applicability, relevance and feasibility of the tools. For this study, the researcher selected six (10%) nurses random to participate in the pilot testing of the questionnaire sheet and checklist from cardiac care units and not excluded from the study sample because of no modifications in the tool.

#### **Administrative and ethical considerations:**

An official permission for data collection in Zagazig University was obtained from the hospital administrative personnel by the submission of a formal letter from the Dean of the faculty of Nursing Zagazig University explaining the aim of the study in order to obtain permission and help.

At the interview, each subject was informed about the purpose, benefits of the study, and nurses were informed that participation was voluntary and they had right to withdraw from the study at any time without given any reason. In addition, confidentiality, and anonymity of the subjects were assured through coding of all data. The researcher assured that the data collected would be confidential and used only to improve nurses' knowledge and practice for the purpose of the study.

#### **Statistical analysis:**

All data were collected, tabulated and statistically analyzed using SPSS 20.0 for windows (SPSS Inc., Chicago, IL, USA 2011). Quantitative data were expressed as the mean  $\pm$  SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage). Percent of categorical variables were compared using Chi-square test or Fisher's exact test when appropriate. Spearman's rank correlation coefficient was calculated to assess relationship between various study variables, (+) sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. P-value  $<$  0.05 was considered statistically significant (S), and p-value  $\geq$  0.05 was considered statistically insignificant (NS).

#### **Results:**

The demographic characteristics of the nurses in the study sample **Table 1:** Reveals that the 58.3% of studied nurses their age was less than 30 years old ranged between 21-55 years old with mean  $\pm$  SD=29.75 $\pm$ 7.22, 63.3% of nurses were females, and 66.7% of the studied nurses were married. As regard level of education 40% of nurses had technical institute. Furthermore 23.3% of the studied nurses had equal or more than 10

years of experience, while more than two third 73.3% of studied nurses did not received training programs regarding care of patients with permanent pacemaker.

**Figure 1:** Found 80.0% of studied nurses had unsatisfactory level of total knowledge regarding the care of patients with permanent pacemaker. with mean±SD 39.6±10.62.

**Table 2:** Illustrates that 86.7% of studied nurses had incorrect answer regarding main parts of pacemaker. Also, 78.3% of studied nurses had incorrect answer regarding pacemaker placed in operation under local anesthesia and 88.3% of studied nurses had correct answer regarding complications of pacemaker.

**Figure 2:** Shows that 90.0% of studied nurses had **unsatisfactory** of total practice regarding the care of patient with permanent pacemaker with Mean ± SD 56.71±17.3.

**Table 3:** Presented that 95.0% of studied nurses didn't check the presence of any allergic history, 93.3% of studied nurses didn't inspect patient mouth and dentures or plates were removed. While 96.7% of studied nurses **asked** patient to fasting from 6-8 hours and **performed** all diagnostic test needed before surgery.

**Table 4:** Clarified that 80.0% of studied nurses didn't assesses respiratory rate, depth, oxygen saturation, and breathing sounds. On the other hand 86.7% of studied nurses **changed** the dressing according to the facility's policy. But 95.0% of studied nurses didn't monitor the patient's physiologic status, manage pain, and provide psychological support.

**Table 5:** Shows that there was highly statistically significant relation between nurses' knowledge and level of education at (p=0.0001\*\*) and their

jobs at (p= 0.0001\*\*). Four fifths (80%) of bachelor's graduated nurses and more than two third (68.8%) of supervisor nurse had satisfactory knowledge level.

**Table 6:** Presents that there was highly statistically significant relation between nurse's practice regarding care the for patient with permanent pacemaker and their level of education (p=0.0001\*\*). In addition to, there was statistically significant relation between nurse's practice and their jobs (p=0.004\*).

**Figure 3:** Clarifies that there was highly statistically significant positive correlation between total knowledge and total practice (r = .735 at p = 0.0001) among the studied nurses.

#### Discussion:

Regarding to demographic characteristic of the studied nurses the result of the present study revealed that more than half of studied nurses their age was less than 30 years old. This result was in the same line with Mohammed & Atiyah<sup>(5)</sup> who stated that nearly to half of studied nurses were 23-27 years old. Two third of studied nurses were females and married, these findings are in the same line with Ismail, *et al*<sup>(11)</sup> who presented that two third of the studied nurses were females

Regarding level of education two fifths of studied nurses had technical institute. This finding was in harmony with Mohammed & Atiyah<sup>(5)</sup> who reported that two fifth of studied nurses had technical nursing institute.

The present study was found that one fifth of studied nurse had more than or equal 10 years of experience in CCU. This was in agreement with Feroze, *et al*<sup>(13)</sup> who founded that more than one fifth of studied nurses had more than or equal 10 years of experience years in CCU.

The current finding reported that nearly three quarters of studied nurses

hadn't previously attended any training courses regarding of the care of patients with permanent pacemaker .This finding was in agreement with Mohammed & Atiyah <sup>(5)</sup> who stated that most of studied nurse hadn't previously attended any training courses regarding the care of patient with pacemaker.

According to nurses' knowledge regarding pacemaker the present study showed that, the majority of studied nurses had unsatisfactory knowledge regarding pacemaker. This may reflect the importance of education program for updating the nurse's knowledge and practice about pacemaker device. This finding go as in the same line with Mohammed *et al.* <sup>(8)</sup> who found that the majority of studied nurses had unsatisfactory level of knowledge regarding permanent pacemaker.

Continuous education is needed to enhance the level of knowledge, skills and competencies in the treatment of patients. From the current study findings, the researchers recommended some strategies to improve nurses' knowledge of management of patients with pacemaker. Firstly, continuous nursing education regarding pacemaker .Secondly, interprofessional learning activities could also be done to engage with the understanding of the management of pacemaker in the different fields, namely cardiovascular technologist, pharmacy, nutrition and therapist. Thirdly, regular assessment for nurses regarding the care of patients with pacemaker. It could lead to improve skills and update the knowledge from time to time

Concerning total practice regarding the care of patients with permanent pacemaker. The present study reported that the most of studied nurse had unsatisfactory practice level regarding the care of patients with permanent Pacemaker. This result was in harmony with Bayomi <sup>(3)</sup> who

presented that the most of studied nurses had unsatisfactory practice level regarding the care of patients with permanent pacemaker.

This result was not correspondent with Beny, <sup>(14)</sup> who clarified that more than third quarters of nurses had satisfactory level of skill about pacemaker care in experimental group after administration of pacemaker care protocol.

knowledge is very important to improve the practice, so this finding may related to knowledge deficit about permanent pacemaker, lack of medical education about pacemaker, lack of training courses to nurses, lack of standardized nursing care procedure or no availability of manual book which contain all nursing procedure in cardiac intensive care units.

As regarding relation of personal characteristics of studied nurses and their knowledge level. The finding of current study indicated that there was highly statistically significant relation between nurses' knowledge and level of education and their jobs. This finding was in agreement with Mohammed *et al* <sup>(8)</sup>, who found that there was statistical significant relation between nurses' knowledge and their age.

Considering the relation of demographic characteristics of studied nurses and their practice level. There was highly statistically significant relation between nurses' practice and their level of education. In addition to, there was statistically significant relation between nurses' practice and their jobs. This finding disagreed with Beny <sup>(13)</sup> ,who stated that was no statistically relation between the selected demographic variables with knowledge score and skill score on pacemaker care protocol among nurses in the experimental group.

Regarding scatter plot for correlation of nurses knowledge and their practice regarding the care of

patient with permanent pacemaker. There was highly statistically significant positive correlation between total knowledge and total practice among studied nurses. This finding in agreement with Thabet <sup>(15)</sup>, who reported that there was positive correlation between total nurse's knowledge score and their total practice score regarding the care of patient with temporary pacemaker.

**Conclusion:**

Based on the results of the present study, it could be concluded that, most of studied nurses had unsatisfactory level of performance (knowledge and practice) regarding the care of patients with permanent pacemaker. There was statistically significant relation between total nurses' knowledge and total nurses' practice, and there was statistically significant relation between nurses'

performance and level of education and their jobs

**Recommendations:**

Based on the results, the study recommended that, training programs are highly recommended to improve nurse's knowledge and practice regarding the care of patient with permanent pacemaker. Standard nursing procedures booklets should be available at all cardiac intensive care units to guide nurses giving the adequate care for patient with permanent pacemaker. Close supervision and teaching on spot are needed to ensure that quality of care is provided by nurses while performing any procedures related to the care of patient with permanent pacemaker. Further study is proposed to assess the effect of educational program on nurses' performance regarding the care of patients with permanent pacemaker.

**Table 1: Frequency and percentage distribution of demographic characteristics of the studied nurses (n=60)**

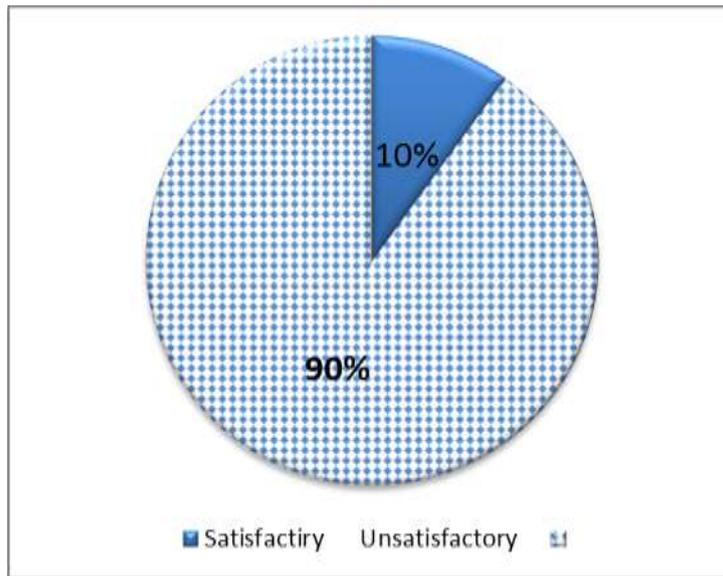
	No	%
<b>Age</b>		
<30	35	58.3
≥30	25	41.7
Mean ±SD		
Median(range)	29.75±7.22	
	28(21-55)	
<b>Sex</b>		
Males	22	36.7
Females	38	63.3
<b>Level of education</b>		
Diploma	21	35.0
Technical institute	24	40.0
Bachelor's	15	25.0
<b>Jobs</b>		
Nurses	44	73.3
Supervisor	16	26.7
<b>Years of experience</b>		
<10	46	
≥10	14	23.3
Mean ±SD	7.22±6.99	
Median(range)	5(1-35)	
<b>Training course</b>		
Yes	16	26.7
No	44	73.3
<b>Marital status</b>		
Single	20	33.3
Married	40	66.7
<b>Income</b>		
Sufficient	25	41.7
Insufficient	35	58.3
<b>Residence</b>		
Rural	45	75.0
Urban	15	25.0



**Figure 1: Percentage** distribution of total nurses' knowledge regarding the care of patients with permanent pacemaker.

**Table 2:** Frequency and percentage distribution of the studied nurses knowledge regarding permanent pacemaker (n=60)

Pacemaker:	Correct		Incorrect	
	No.	%	No.	%
- Definition of pacemaker.	55	91.7	5	8.3
- Main parts of pacemaker.	8	13.3	52	86.7
- Main Function of pacemaker.	38	63.3	22	36.7
- Indication of pacemaker.	42	70.0	18	30.0
- Types of pacemaker.	23	38.3	37	61.7
-Pacemaker placed under local anesthesia.	13	21.7	47	78.3
-Pacemaker placed under general anesthesia.	28	46.7	32	53.3
-Battery life of pacemaker.	24	40.0	36	60.0
-Signs and symptoms of pacemaker failure.	30	50.0	30	50.0
- Signs of lead wires displacement.	53	88.3	7	11.7
-Complications of pacemaker.	53	88.3	7	11.7



**Figure 2:** Percentage distribution of total nurses' practice regarding the care of patients with permanent pacemaker.

**Table 3:** Frequency and percentage distribution of the studied nurses practice regarding pre-operative care (n=60)

Pre-Operative care	Done		Not done	
	No.	%	No.	%
1-Explain the procedure to the client.	20	33.3	40	66.7
2- Obtain voluntary and written informed consent from the patient.	57	95.0	3	5.0
3- Ask patient to fasting from 6-8 hours.	58	96.7	2	3.3
4- Check the presence of any allergic history to any medications, iodine, latex, tape, or anesthetic agents.	3	5.0	57	95.0
5- Physical examination is performed to patient.	7	11.7	53	88.3
6-Assessment of a patient's nutritional status identifies factors that can affect the patient's surgical course, such as obesity weight loss, malnutrition.	8	13.3	52	86.7
7-Training Patient about deep breathing, coughing, and using of incentive spirometry.	10	16.7	50	83.3
8-Instruct patient about early mobility and active body movement to improve circulation, prevent venous stasis, and promote optimal respiratory function.	10	16.7	50	83.3
9-Providing psychosocial interventions to reduce anxiety and fear.	13	21.7	47	78.3
10- Establish an IV line.	57	95.0	3	5.0
11- Obtain baseline vital signs and a baseline ECG.	58	96.7	2	3.3
12- Perform all diagnostic test needed before surgery.	58	96.7	2	3.3
13- Shave the patient's chest from the axilla to the midline and from the clavicle to the nipple line on the side selected by the doctor and clean skin with appropriate anti septic solution.	23	38.3	37	61.7
14-The mouth is inspected, and dentures or plates are removed.	4	6.7	56	93.3
15-Remove Jewelry to prevent injury and remove makeup or finger polish.	12	20.0	48	80.0
16-All articles of value, including assistive devices, dentures, glasses, and prosthetic devices, are given to family members.	24	40.0	36	60.0
17-All patients should void immediately before going to the	24	40.0	36	60.0

operating room" OR".				
18-Urinary catheterization is performed if necessary.	19	31.7	41	68.3
19-Administering Preanesthetic medication as prescribed.	51	85.0	9	15.0

**Table 4:** Frequency and percentage distribution of the studied nurses practice for post-operative care (n=60)

Post-Operative care	Done		Not done	
	No.	%	No.	%
1- Check vital signs and level of consciousness "LOC" every 15 minutes for the first hour, every hour for the next 4 hours, and then every 4 hours.	27	45.0	33	55.0
2- Monitor the patient's ECG to check for arrhythmias and to ensure correct pacemaker functioning.	54	90.0	6	10.0
3- Administering supplemental oxygen.	54	90.0	6	10.0
4-Assesses respiratory rate, depth, ease of respirations, oxygen saturation, and breathing sounds.	12	20.0	48	80.0
5- Monitor cardiovascular stability by assessment of vital signs, cardiac rhythm, assess skin temperature, color, and moisture; and urine output.	11	18.3	49	81.7
6- Check the dressing for bleeding.	19	31.7	41	68.3
7-Controlling nausea and vomiting: the patient is turned completely to one side to promote mouth drainage and prevent aspiration of vomitus and administer of antiemetic.	26	43.3	34	56.7
8- Change the dressing according to your facility's policy.	52	86.7	8	13.3
9- Minimize movement of the affected arm and shoulder during the initial postoperative period by the restricting movement to prevent the dislodgement of the implanted pacemaker.	6	10.0	54	90.0
10-Monitors the patient's physiologic status, manages pain, and provides psychological support in an effort to relieve the patient's fear.	3	5.0	57	95.0
11- Performe gentle range of motion exercises "ROM" exercises at least three times daily, beginning 24 hours after pacemaker implantation.	5	8.3	55	91.7
12- Provide a pacemaker identification card including the rate parameters, pacemaker type, manufacturer, serial number and expected battery life.	52	86.7	8	13.3
13-Encourage the client for regular and periodic follow up sessions to ensure the functioning of the pacemaker.	15	25.0	45	75.0
14-Document the date of pacemaker insertion the model and type and setting.	15	25.0	45	75.0

**Table 5:** Relation of demographic characteristics of the studied nurses and their total knowledge level regarding the care of patients with permanent pacemaker (n= 60):

Demographic characteristics	Total nurses' knowledge regarding care of patients with Permanent pacemaker				No	$\chi^2$	p-value
	Satisfactory		Unsatisfactory				
	No.	%	No.	%			
Age\ yrs							
<30	8	22.9	27	77.1	35	0.43	0.51
≥30	4	16.0	21	84.0	25		
Gender							
Males	4	18.2	18	81.8	22	F	0.88
Females	8	21.1	30	78.9	38		
Level of education							
Diploma	0	.0	21	100.0	21	45	0.0001**
Technical institute	0	.0	24	100.0	24		
Bachelor's	12	80.0	3	20.0	15		
Jobs							
Nurses	1	2.3	43	97.7	44	F	0.0001**
Supervisor	11	68.8	5	31.3	16		
Years of experience							
<10	11	23.9	35	76.1	46	F	.26
≥10	1	7.1	13	92.9	14		
Training courses							
Yes	3	18.8	13	81.3	16	F	0.99
No	9	21.4	35	78.6	44		
Marital status							
Single	4	25.0	16	75.0	20	F	0.99
Married	8	20.0	32	80.0	40		
Income							
Sufficient	7	28.0	18	72.0	25	1.7	0.19
Insufficient	5	14.3	30	85.7	35		
Residence							
Rural	8	17.8	37	82.2	45	F	0.47
Urban	4	26.7	11	73.3	15		

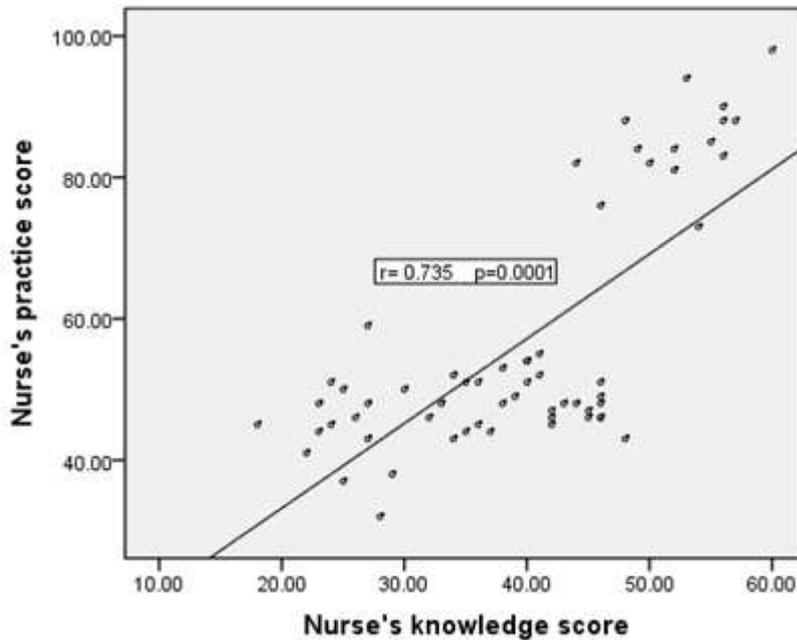
$\chi^2$  =Chi square test f=Fisher exact test \*\*highly significant p<0.001 p>0.05 insignificant

**Table 6:** Relation of demographic characteristics of studied nurses and their total practice level regarding care for patients with permanent pacemaker (n=60).

Demographic characteristics	Total practice				n.	p-value
	Satisfactory		Unsatisfactory			
	No.	%	No.	%		
Age\ yrs						
<30	5	14.3	30	85.7	35	0.386
≥30	1	4.0	24	96.0	25	
Gender						
Males	2	9.1	20	90.9	22	0.99
Females	4	10.5	34	89.5	38	
Level of education						
Diploma	0	.0	21	100.0	21	$\chi^2 =20$
Technical institute	0	.0	24	100.0	24	
Bachelors'	6	40.0	9	60.0	15	0.0001**
Jobs						

Nurses	1	2.3	43	97.7	44	0.004*
Supervisor	5	31.3	11	68.8	16	
Years of experience	.	.	.	.		
<10	5	10.9	41	89.1	46	0.99
≥10	1	7.1	13	92.9	14	
Training courses	.	.	.	.		
Yes	3	18.8	13	81.2	16	0.33
No	3	6.8	41	93.2	44	
Marital status	.	.	.	.		
Single	2	10.0	18	90.0	20	1
Married	4	10.0	36	90.0	40	
Income	.	.	.	.		
Sufficient	5	20.0	20	80.0	25	.073
Insufficient	1	2.9	34	97.1	35	
Residence	.	.	.	.		
Rural	4	8.9	41	91.1	45	.63
Urban	2	13.3	13	86.7	15	

$\chi^2$  =Chi square test f=Fisher exact test \*\*highly Significant p<0.001 \*Significant p<0.05 non- significant p>0.05



**Figure 3:** Scatter plot for correlation of total nurses knowledge and their total practice regarding the care of patient with permanent pacemaker (n=60).

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