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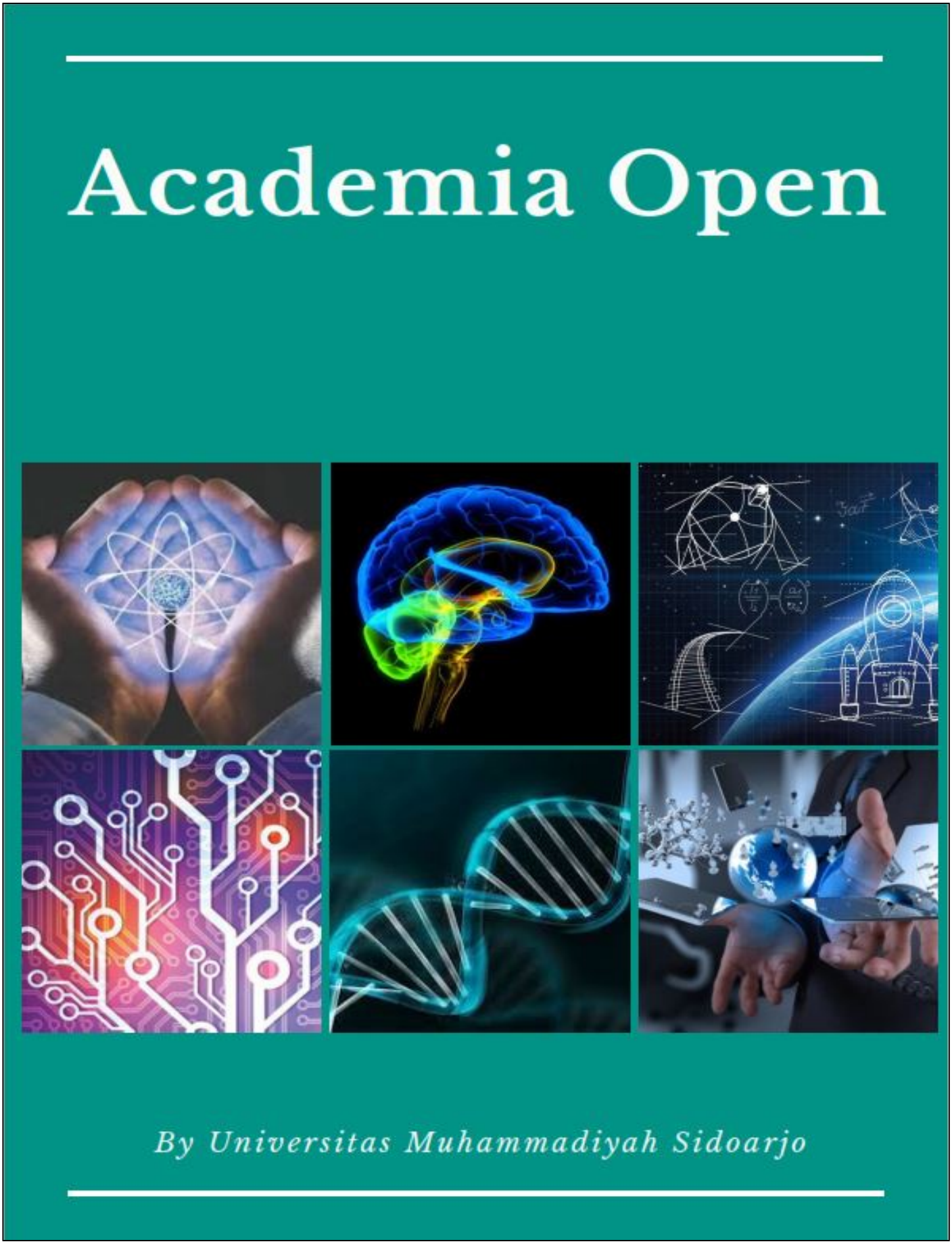

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Nurses' Knowledge and Attitudes toward Pacemaker: A Cross-Sectional Study

Pengetahuan dan Sikap Perawat terhadap Alat Pacu Jantung: Sebuah Studi Cross-Sectional

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Abstract

Despite the critical role of pacemakers in managing symptomatic atrioventricular and ventricular conduction abnormalities, there remains a significant gap in the knowledge and attitudes of nurses towards these devices. This study assesses the understanding and perceptions of pacemakers among nurses in Al-Basrah Governorate hospitals, exploring associations with demographic factors such as age, gender, educational level, years of experience, and training. Employing a descriptive methodology, a non-probability sample of 200 nurses from five hospitals (Abi Al-Khasib General Hospital, Umm Qasr General Hospital, Al-Zubair General Hospital, Al-Shifaa Hospital, and Al-Mawani Teaching Hospital) was surveyed from October 15, 2022, to August 15, 2023. Content validity was ensured by engaging eleven professionals, while reliability was assessed using Cronbach's Alpha. Results indicate a concerning deficiency in pacemaker-related knowledge, with 79.5% of nurses demonstrating poor knowledge, 18% showing intermediate knowledge, and only 2.5% exhibiting high knowledge. Similarly, attitudes were predominantly negative, with 81.5% of nurses expressing low enthusiasm towards pacemakers, while 11% and 7.5% displayed intermediate and high attitudes, respectively. These findings highlight the need for targeted educational interventions aimed at enhancing nurses' competence and attitudes concerning pacemakers to improve postoperative care and management outcomes for patients with these devices.

Highlights:

- Knowledge Gap: A significant 79.5% of nurses show insufficient knowledge of pacemakers, indicating a critical need for improved medical education.
- Attitudinal Barriers: Over 81% of nurses have negative attitudes towards pacemakers, which may affect patient care quality.
- Training Requirement: There's a clear need for specialized training programs for nurses on pacemakers to enhance their knowledge and attitudes, ultimately improving patient care.

Keywords: Pacemaker Knowledge, Nursing Attitudes, Educational Interventions

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Introduction

One of the main issues with the heart is cardiac rhythm dysfunction. Temporary or permanent pacemakers may treat cardiac rhythm disorders, replacing sluggish or erratic beats with regular impulses. Bradycardia results from a heart rhythm problem. Bradycardia may lead to dyspnea, congestive heart failure, and deficiencies in tissue perfusion. Patients who have bradycardia due to a rhythm issue need cardiac pacemakers, either temporary or permanent [1].

An artificial cardiac pacemaker is an electronic device that keeps the heart beating when the normal conduction pathway is impaired. The basic pacing circuit consists of the myocardium, one or more pacing leads, and a power source (battery-powered pulse generator) with programmable electronics. Through the leads, the pulse generator stimulates the wall of the myocardium with an electrical signal. The cardiac muscle that has been "captured" is then prompted to contract [2].

The pacemaker is a little device that promotes more regular heartbeats. It does this by using the electrical impulses sent by electrodes that detect the heart's natural rhythm and administer electric stimulation as necessary. Permanent pacemakers are often positioned immediately under the collarbone on the chest. When the heart's SA node isn't working correctly, pacemakers electronically stimulate the myocardial layer to depolarize or cause a contraction. They are mostly used to address long-term cardiac rhythm disorders [3].

Some arrhythmia symptoms, such as fatigue, may be alleviated with a pacemaker. A pacemaker may also assist someone with irregular cardiac rhythms in returning to an active lifestyle. The condition that causes the heart to fail to begin or conduct enough intrinsic electrical impulse to sustain perfusion is the one that most often necessitates the use of a cardiac permanent pacemaker. When dysrhythmias or conduction problems endanger the heart's electrical system and hemodynamic response, pacemakers are required. Two primary tasks are carried out by the pacemaker system, which comprises a pulse generator and one to three leads with electrodes: both diagnostic and therapeutic [4].

The World Health Organization (WHO) estimates that cardiovascular disease caused 17.9 million deaths globally in 2016 [5]. In addition, according to [6], sudden cardiac death is thought to be the cause of over 450,000 fatalities globally. Poor electrical conduction in the heart is regarded as a serious problem that might result in congestive heart failure or other problems, including death [7]. Permanent pacemakers (PPMs), which support the heart when the rate of heart rhythm falls below 60 beats per minute, may currently be used to treat heart rhythm problems. It serves as a synthetic Sino-atrial node and aids in draining the electrical system of the heart to increase heart rate to 60 beats per minute [8].

High-grade atrioventricular block or symptomatic bradycardia are now often treated with cardiac stimulation. The incidence of pacemaker implantation has skyrocketed in recent years. The major causes of this rate's rise are the technical developments of these devices and the expanding variety of therapeutic indications. Around the globe, 1.25 million permanent pacemakers are inserted each year [9]. Cardiac rhythm disturbance is one of the most dangerous cardiovascular conditions. The heart may beat too quickly, too slowly, or irregularly during an arrhythmia. Other arrhythmias are innocuous, while others are severe or life-threatening. Since dysrhythmias reduce the heart's ability to pump enough blood and oxygen, a pacemaker will be needed to keep the patient's heart beating regularly and maintain their health [10].

Care for patients with permanent pacemakers necessitates knowledge of the device, its complications, and related variables, as well as patient hemodynamic state. Nurses' knowledge can be crucial and helpful in patient education and enhance the reduction of complications during the device's lifetime. It is possible to avoid issues and device flaws by providing these patients with the appropriate nursing care [11].

Nurses who specialize in critical care play a crucial part in providing treatment for pacemaker patients. Patients are monitored by nurses who keep a lookout for pacemaker troubles and insertion-related complications after permanent pacemaker implantation. Postoperative complications include magnetic fields, an AF signal, pneumothorax, hematoma, lead displacement, infection, cardiovascular perforation, and tamponade [12].

The nurse must at least be familiar with the pacemaker's programmed mode of pacing and lower rate setting to assess pacemaker performance. Setting adjustments for permanent pacemakers are made non-invasively using a specialized programmer that employs pulsed ECG strips, and the doctor is informed if a pacemaker issue is detected so that the pacemaker setting may be adjusted as necessary. If the patient exhibits signs of reduced cardiac output, temporary pacemaker assistance may be needed until the issue is resolved [12].

Method

A study of nurses' attitudes and knowledge about pacemakers in a descriptive cross-sectional design was carried out in the Al-Basrah Governorate. From October 15, 2022, through August 15, 2023, the study's period was

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expanded. Just a few of the hospitals in the Al-Basrah Governorate that took part in the research include Al-Mawani Teaching Hospital, Al-Faiha Teaching Hospital, Al-Basrah Teaching Hospital, Abi Al-Khasib General Hospital, Umm Qasr General Hospital, Al-Zubair General Hospital, and Al-Shifaa Hospital. Additionally, these hospitals' emergency departments, medical and surgical wards, operating rooms, and medical wards all participated in the research. In the non-probability (purposeful) sample, 200 nurses who work in operating rooms, emergency departments, medical wards, and surgical wards are represented. The analysis did not include the nurses who took part in the pilot study. The researcher explained the goals of the study to each nurse before they consented to take part. The study maneuver was shown to have no direct or indirect negative effects on the research sample. Each nurse verbally consented before data collection. Nurses who agree to participate in the research and work in surgical wards, operating rooms, emergency departments, and medical wards meet the inclusion criteria. all educational levels of nurses.

Based on a comprehensive review of relevant literature and previous studies, the researcher created a questionnaire to accomplish the objectives, which was then used to gather data for the study project related to cholecystectomy. There are five parts to it: Basic demographic information collection is the emphasis of the first segment. The nurses' gender, age, education level, years of experience, involvement in pacemaker training courses, and location of employment were all elicited via direct interviews. It was created to assess the nurses' understanding of pacemakers. There were twelve pieces in all. The purpose of the third portion was to assess the nurses' understanding of cholecystectomy complications. There were thirteen objects in total. The purpose of the fourth portion was to assess the nurses' understanding of probable postoperative nursing care issues. There were twelve items in it. The purpose of this part was to determine how the nurses felt about cholecystectomy. There was a total of seven things. The instrument's (questionnaire's) content validity has been validated by a committee of twelve specialists. These experts are Basrah University graduates.

These specialists were given a copy of the research instrument and requested to examine and test it to make sure the data was accurate and comprehensive enough to look into the substance of the questionnaire. The researcher followed both pieces of advice from the authorities. Certain aspects were overlooked after accounting for all the suggestions and criticisms. Following the necessary modifications based on their replies, the questionnaire was deemed accurate. When the reliability of the testing instrument was assessed using the Statistical Package for Social Science (SPSS) program for 52 questions, knowledge and attitudes scored (0.81) and (0.79), respectively, on Cronbach's Alpha. Three (3) point Likert scales, from one (1) to three (3), were used. Each of the measure's (45) items was evaluated using a three-point Likert scale with the values 1 (Don't know), 2 (Uncertain), and 3 (Know). Ten to fifteen minutes were given to each nurse to finish the examination. The cut-off points for each item on the knowledge scales were determined by the researcher to be (1-1.66) for poor knowledge, (1.67-2.33) for intermediate knowledge, and (2.34-3) for good knowledge. These results were utilized to measure each item's level of evaluation.

Results and Discussion

A. Results

These findings demonstrate the sociodemographic characteristics of the study's nurses. The age group (30-39) years comprised 47.5% of the population, with women making up 67.5%. In terms of educational levels, the secondary school (57%) has the biggest proportion. The group with the largest proportion of years of experience is those with 6 to 10 years (43%). The majority of them (28.5%) do emergency jobs. The majority of nurses (94%) lacked any pacemaker training.

The results of this research show that, at the mean score and standard level deviation of (1.50+0.690), the majority of nurses (79.5%) have inadequate knowledge of pacemakers, while only 18% and 2.5%, respectively, have moderate and excellent knowledge.

With a P-value of 0.05, this research demonstrates a strong correlation between nurses' educational background and pacemaker training.

Additionally, the results of this table demonstrate that there is no correlation between nurses' knowledge of pacemakers and their gender, age, years of experience, or location of employment (P-value > 0.05).

According to the results of this table, the mean score and standard level deviation are (1.50+0.708), which shows that the majority of nurses (81.5%) have poor attitudes about pacemakers, (11%) have moderate attitudes, and (7.5%) have good attitudes.

At a P-value of 0.05, this research demonstrates a significant association between nurses' educational attainment and training and their attitudes regarding pacemakers.

Additionally, the results of this research demonstrate that there is no connection between nurses' opinions about pacemakers and their gender, age, years of experience, or location of employment (P-value > 0.05).

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Demographic Data			
Variables	Classes	Frequency	%
Gender	Male	65	32.5 %
	Female	135	67.5 %
	Total	200	100 %
Age	20-29	66	33 %
	30-39	95	47.5 %
	40-49	32	16 %
	50 and more	7	3.5 %
	Total	200	100 %
Education level	Secondary School	114	57 %
	Nursing Institute	68	34 %
	College of Nursing	18	9 %
	Total	200	100 %
Years of experience	1-5	56	28 %
	6-10	86	43 %
	11-15	41	20.5 %
	More than 15	17	8.5 %
	Total	200	100 %
Place of Work	Surgical Wards	31	15.5 %
	Operating Room	28	14 %
	Coronary Care Unit	23	11.5 %
	Emergency	57	28.5 %
	Open Heart	24	12 %
	Cardiac Catheterization	37	18.5 %
	Total	200	100 %
Training Course	Yes	12	6 %
	No	188	94 %
	Total	200	100 %

Table 1. ***Demographic Variables for the Nursing Staff***

Nurses' Knowledge						
Assessment levels	Frequency	Percent	Scale	Total		
				Mean of Score	Sd	Assessment
Poor	159	79.5%	1 – 1.66	1.50	0.690	Poor
Moderate	36	18%	1.67 – 2.33			
Good	5	2.5%	2.34 – 3			
Total	200	100 %				

Table 2. ***Nurses' Knowledge toward Pacemaker***

Sd=Standard Deviation.

Demographic Data with Nurses' Knowledge (all domains)					
Variables	Classes	Knowledge			Significant
		Poor	Moderate	Good	
Gender	Male	53	9	3	Chi-Square= 2.697 Df= 2 P-Value= 0.260 NS
	Female	106	27	2	
Age	20-29	53	11	2	Chi-Square = 3.767 Df= 6 P-Value= 0.708 NS
	30-39	72	20	3	
	40-49	27	5	0	
	45 and more	7	0	0	
Education Level	Secondary School	113	1	0	Chi-Square= 127.340 Df= 4 P-

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	Institute	46	22	0	Value= 0.000 HS
	College	0	13	5	
Years of Experience	1-5	44	11	1	Chi-Square = 2.046 Df= 6 P-Value= 0.915 NS
	6-10	66	17	3	
	11-15	34	6	1	
	More than 15	15	2	0	
Place of Work	Surgical Wards	27	4	0	Chi-Square= 5.184 Df= 2 P-Value= 0.75 NS
	Operating Room	19	7	2	
	Coronary Care Unit	16	7	0	
	Emergency	48	8	1	
	Open Heart	20	4	0	
	Cardiac Catheterization	29	6	0	
Training Course	Yes	0	8	4	Chi-Square= 75.493 Df= 2 P-Value= 0.000 HS
	No	159	28	1	

Table 3. ***Relationship between Demographic Variables and Nurses' Knowledge***

Df: Degree of freedom, P: Probability value, NS: Not Significant, HS: High significance

Table (4): Nurses' Attitudes toward Pacemaker

Nurses' Attitudes						
Assessment levels	Frequency	Percent	Scale	Total		
				Mean of Score	Sd	Assessment
Poor	163	81.5%	1 – 1.66	1.50	0.708	Poor
Moderate	22	11%	1.67 – 2.33			
Good	15	7.5%	2.34 – 3			
Total	200	100 %				

Table 4. ***Nurses' Attitudes toward Pacemaker***

Sd=Standard Deviation.

Demographic Data with Nurses' Attitudes					
Variables	Classes	Attitudes			Significant
		Poor	Moderate	Good	
Gender	Male	53	8	4	Chi-Square= 0.382 Df= 2 P-Value= 0.826 NS
	Female	110	14	11	
Age	20-29	54	7	5	Chi-Square = 2.253 Df= 6 P-Value= 0.895 NS
	30-39	75	11	9	
	40-49	28	3	1	
	45 and more	6	1	0	
Education Level	Secondary School	114	0	0	Chi-Square= 202.676 Df= 4 P-Value= 0.000 HS
	Institute	49	19	0	
	College	0	3	15	
Years of Experience	1-5	47	6	3	Chi-Square = 10.497 Df= 6 P-Value= 0.105 NS
	6-10	66	9	11	
	11-15	33	7	1	
	More than 15	17	0	0	
Place of Work	Surgical Wards	26	5	0	Chi-Square = 12.079 Df= 10 P-Value= 0.280 NS
	Operating Room	19	5	4	
	Coronary Care	19	3	1	

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	Unit				
	Emergency	51	2	4	
	Open Heart	18	4	2	
	Cardiac Catheterization	30	3	4	
Training Course	Yes	0	2	10	Chi-Square= 108.661 Df= 2 P-Value= 0.000 HS
	No	163	20	5	

Table 5. ***Relationship between Demographic Data and Nurses' Attitudes***

Df: Degree of freedom, P: Probability value, NS: Not Significant, HS: High significance

B. Discussion

1. Socio-Demographic Data

In terms of gender, this research reveals that women make up the majority of the samples, accounting for (67.5%). This research supported [13], which indicates that the majority of respondents (83.3%) were female. Around the globe, female nurses predominate. In Iraq, the Nursing Institutes and Colleges admit more women than men.

The features of the current sample used in this research fell within the 30–39 age range (47.5%). These findings corroborated [13] that the majority of nurses (38.1%) were in the 30- to 39-year-old age range. The researcher believes that the nurses working in surgical wards and operating rooms are youthful because young individuals have a stronger motivation to learn more and enhance their competence. Furthermore, more muscle is required for this action.

The proportion of secondary school students in the current research (57%) is the greatest. The results of this survey were in agreement with, according to which the percentage of nursing secondary schools was at 40%. In Iraq, there are nursing institutes, colleges, and secondary schools. Nearly all wards are staffed by graduate nurses from nursing secondary schools and nursing institutions. As opposed to other nurses, college-trained nurses work in critical care units and get less money.

According to this research, 43% of nurses had between six and ten years of experience. These findings are consistent with, which demonstrates that the majority of the sample (5-10) years of experience, or 47.5%.

The majority of the research sample's employees (28.5%) worked in the emergency room. These findings agreed with (14) which stated that most nurses worked in medical critical care (62.5%).

The majority of nurses (94%) do not have any formal training. The findings of this research are in line with those (1) which show that the majority of nurses (80%) do not have a training program.

2. Nurses' Knowledge about Pacemaker

The statistics of nurses' pacemaker knowledge were analyzed in the study's findings. Statistics on nurses' knowledge are broken down into three main categories: postoperative nursing care, problems related to pacemakers, and nurses' knowledge of pacemakers.

The results of this survey show that the majority of nurses (79.5%) have little knowledge about pacemakers.

The researcher thinks there might be a variety of reasons for nurses' limited pacemaker expertise. All nursing education levels found that nurses did not learn enough about pacemakers. The nurses do not regularly refresh their knowledge of pacemakers and do not get enough training in this area.

The results of this investigation were in agreement with; in their study, (80%) of the nurses were found to have an inadequate degree of pacemaker knowledge. The findings of this research were in agreement with those of a study [14] whose findings revealed that 77.5 percent of nurses had an inadequate level of knowledge about the treatment of patients who were wearing temporary pacemakers.

3. Relationship between Nurses' Knowledge and Demographic Data

The results of this research show a strong association between nurses' knowledge and the demographic factors of the study group (education level and training courses).

The findings of the current study agreed with a study [14] which stated there is a significant relationship between nurses’ knowledge and their level of education.

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The research's conclusions indicate that there is no correlation between nurses' knowledge and the demographic factors of the study group, including gender, age, years of experience, and place of employment. The outcomes of the current research are consistent with a study [14] which stated there is no significant relationship between nurses' knowledge and their (gender and units working).

4. Nurses' Attitudes about Pacemaker

Most nurses (81.5%) have poor attitudes against pacemakers, according to the findings of the current research.

The findings of this research were in agreement with a study [15] on nurses' attitudes and knowledge of thyroidectomy, which found that nurses' attitudes and knowledge of thyroidectomy were inadequate.

Additionally, the results of the current research contradicted those of a study [16] done in Egypt about nurses' knowledge, attitudes, and practices involving thyroidectomy patients. The findings demonstrate that the nurses had a positive attitude about thyroidectomy.

The study's findings indicate a substantial correlation between nurses' knowledge and their demographic factors (educational attainment and years of experience). The findings of the current research were in agreement with those of a study on nurses' knowledge, attitudes, and practices regarding thyroidectomy patients that was done in Egypt [16]. The findings revealed a substantial correlation between nurses' opinions and their educational and professional backgrounds.

Conclusions

The majority of the nurses in the current research were female, aged between 30 and 39, had a secondary education, six to ten years of experience, worked in emergencies, and had not taken a pacemaker training course. The majority of the nurses who took part in the research had little knowledge about pacemakers and their problems, as well as postoperative nursing care. Most of the nurses who took part in this research had poor attitudes toward pacemakers. Nurses' knowledge and attitudes are significantly correlated with their education level, years of experience, and training courses. Demographic information, such as gender, age, marital status, and location of employment, do not significantly affect nurses' knowledge and attitudes.

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