# شكـــــر


خالص الشكر والتقدير للسادة الأساتذة اللذين قاموا بالإشراف على تلك الرسالة وهم

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كما اشكر كل من تعاون معي لأنهاء هذا العمل وأخص بالذكر عائلتي وزملائي وزميلاتي.


رسـالة دكتوراه

اسم الطالبة: جيهان سيد يوسف

تخصص: تمريض جراحي باطني

اسم الدرجة: درجة الدكتوراه في علوم التمريض

عنوان الرسالة: تأثير برنامج تعليمي على جودة الحياة للمرضى ذو جهاز منظم ضربات القلب الدائم

Effect of educational program on quality of life of patients with permanent pacemaker

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# تعريـــف الباحـــث

**اسم الباحثة:** جيهان سيد يوسف

**اسم الدرجة:** الدكتوراه

**القسم التابع له:** تمريض جراحي باطني

**اسم الكلية:** كلية التمريض

**اسم الجامعة:** جامعة عين شمس

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# Introduction

Artificial cardiac pacemakers are defined as an electronic device that delivers electrical stimulation to the heart; it was utilized in the treatment of cardiac dysrhythmias that are caused by an alteration in the normal electrical pathway in the heart, a pacemaker is a small device that's placed in the chest or abdomen to help control abnormal heart rhythms. This device uses electrical pulses to prompt the heart to beat at a normal rate ***(Black &Hawks, 2010).***

Arrhythmias are problems with the rate or rhythm of the heart beat, during an arrhythmia, the heart can beat too fast or too slow, or with an irregular rhythm, a heartbeat that's too fast is called tachycardia, a heart beat that's too slow is called bradycardia, during an arrhythmia, the heart may not be able to pump enough blood to the body. This may cause symptoms such as fatigue (tiredness), shortness of breath, or fainting. Severe arrhythmias can damage the body's vital organs and may even cause loss of consciousness and death. The pacemaker can relieve some arrhythmias symptoms, such as fatigue and fainting, pacemaker can help a person who has abnormal heart rhythms to resume a more active lifestyle ***(Smeltzer, Bare, Hinkle, & Cheever, 2010).***

The artificial pacemaker is a small battery device designed to work with the heart to help the body get the oxygen rich blood. The pacemaker works by sending out tiny electrical

impulses down the lead to the heart, when the heart muscle receives the electrical signal; it contracts or beats ***(Osborn, Wrra, & Watson, 2010).***

Educational program for patients is a foundation and integral component of intervention, eventually result in better control, and improve the quality of life and compliance. However, any educational intervention should include an assessment of patient's learning needs and cultural background, the content of the educational program should be relevant, simple, understandable, clear and applicable. The educational content should be explained with details to the patients and in a simple way and with suitable media to maintain understanding. Health education should aim to help the patients to develop coping with disease, treatment, change bad behaviors pattern and to reinforce positive activity ***(Abd Elazzeem, 2008).***

Nurse plays an important role when patients arrive at hospitals undergoing pacemaker starting by gathering information, observe, signs and symptoms, complications and begins to teach the patients and their families. Nurse must recognize the patient's emotional status, and learning needs. Moreover, educating cardiac patients is becoming an active life style after a permanent pacemaker implantation ***(Stewart, Jane & Shaheen, 2011)***.

According to ***Faltas (2013),*** educating patients with pacemaker about the diseases and treatment plans is very

important if the nurse wants them to follow the prescribed instructions as exercises and other life style changes.

The best results come when nurse combines education with behavior modification strategies and emotional support. Education may assist the patients and the patients were empowered by knowledge to understand the disease, therapeutic regimen, medications and their side effects, cope with changes that occur with pacemaker treatment, detection of malfunctions and follow up care, improve compliance with the therapeutic regimen, coping with the disease and quality of life ***(Andrew, 2011, Hassan, 2011).***

Quality of life (QOL) is the person's sense of wellbeing that stems from satisfaction or dissatisfaction with the areas of life that are important to person ***(Blaha, Robison, Pugh, Bryan, & Havens, 2007)***. QOL refers to physical, psychological, social and spiritual domains of health, where the perceptions of health are characterized by person's experiences, beliefs and expectations, which play a pivotal role ***(Doba, Karen & Hess, 2007 and Ramadan, 2011).***

## Significance of the Study:

Cardiac pacemaker has become quite effective and reduces symptoms, improves quality of life. Pacemaker is prescribed to approximately **600000** persons worldwide each year and as mentioned by ***Kirk (2012)***, who identified that about 4.6 million pacemakers and implantable defibrillator devices **(ICDs**) were sold between 2006 and 2011, in the US, approximately 500000 Americans have an implantable permanent pacemaker device. ***(Medstar Health Cardiology Associates, 2014)*** mentioned that more than 3 million people worldwide currently rely on pacemakers to correct a slow, irregular, or otherwise abnormal heartbeat.

The coronary care unit and open heart intensive care unit in Ain Shams University Hospital statistic reports during **2009-2010** revealed that the total number of admitted patients was **1100, 344** of them were having permanent pacemaker and temporary pacemaker, which represent 30% from the total.

Cardiac patients with permanent pacemaker are liable to different complications, most of these complications were life threatening as feeling of dizziness may indicate that the device is not working properly and should be reported to the doctor. Other complications that may arise from pacemaker infection although it can be prevented by collaborative care and educational interventions to save patients' lives and help patients to cope with devices. Patients should be oriented by complications, how to prevent them and how to follow the

different therapeutic regimens, as well quality of life (QOL) is promoted by comprehensive nursing intervention and patient's education. That is why it is crucial to measure QOL for those patients to give them a comprehensive care.

# Aim of the Study

This study aims to evaluate the effect of the educational program on quality of life of patients with permanent pacemaker through:

1. Assess level of knowledge and performance for patients with permanent pacemaker pre and post implementation of educational program.
2. Develop the educational program for patients with permanent pacemaker.
3. Assess compliance level to the prescribed therapeutic regimen for patients with permanent pacemaker pre and post implementation of educational program.
4. Assess quality of life for patients with permanent pacemaker pre and post implementation of educational program.

## Research Hypothesis:

The educational program will affect positively on quality of life of the study group of patients with permanent pacemakers in comparison to the control group who will not be exposed to the program.

# Review of literature

## Anatomy and Physiology of the Heart

The heart is a hollow, muscular organ, falls in the center of the thorax, where it occupies in the space between the lungs and rest on the diaphragm, it weighs approximately 300 gm. The heart is composed of three layers, the inner layer or (endocardium) consists of endothelial tissues, and lines in the inside of the heart and valve, the middle layer or myocardium made up of muscle fibers and is responsible for the pumping action, the exterior layer of the heart is called the epicardium ***(Bears & Myer, 2006).***

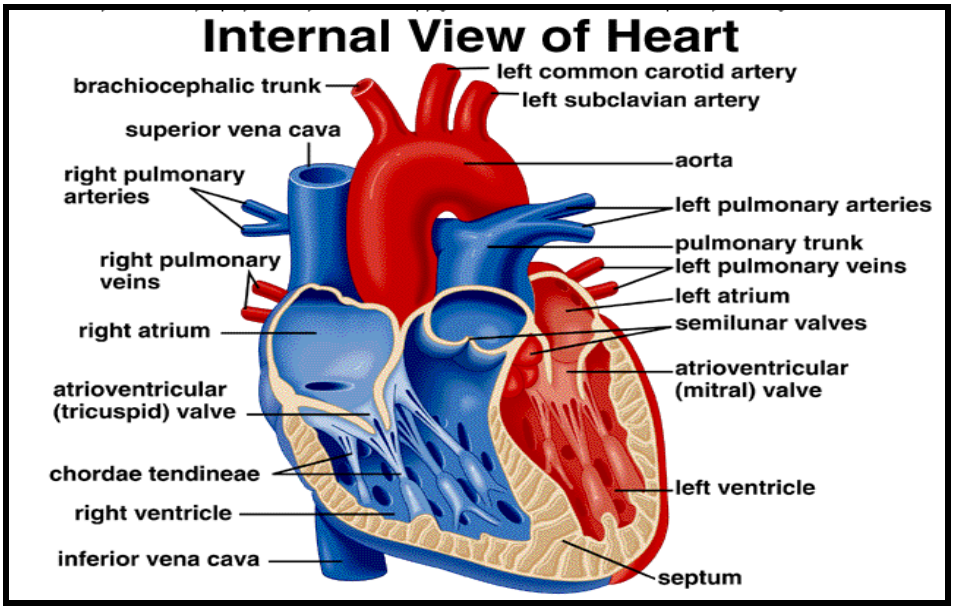


**Figure (1):** Structure of the heart
***(University of Maryland Medical Center, 2012).***

The heart is encased in a thin fibrous sac called the pericardium which is composed of two layers adhering to the epicardium is the visceral pericardium, enveloping the visceral pericardium is the parietal pericardium a taught fibrous tissue that attaches to the great vessels, diaphragm, sternum and vertebral column and supports the heart in the mediastinum. The space between these two layers pericardial space is normally filled with about 20 ml of fluids, which lubricate the surface of the heart and reduce friction during systole ***(Osborn et al, 2010).***

The right side of the heart made up of the right atrium and right ventricle which distribute venous blood to the lungs via pulmonary artery for oxygenation. The right atrium receives blood returning from the superior vena cava (head, neck and upper extremities), inferior vena cava (trunk and lower extremities) and coronary sinus or circulation. The left side of the heart is composed of the left atrium and left ventricle which distribute oxygenated blood to the remainder of the body via the aorta, the left atrium receives oxygenated blood from the pulmonary circulation via four pulmonary veins ***(Taylor, Lillis, & Lemone, 2011).***

The four valves in the heart permit blood to flow in only one direction, the valves which are composed of thin fibrous leaflets, open and close in response to the movement of blood and pressure changes within the chambers. There are two types of valves, the atrioventricular and the semilunar. The

atrioventricular valves separate the atria from the ventricle, the tricuspid valve so named because it is composed of three cups or leaflets; separates the right atrium from the right ventricle. The mitral or bicuspid valve lies between the left atrium and left ventricle. The semilunar valves are composed of three leaflets which are shaped like half-moon, the valve between the right ventricle and the pulmonary artery is called the pulmonic valve, the valve between the left ventricle and the aorta is called the aortic valve ***(Kier, Jhon, & Kora, 2014).***

The left and right coronary arteries and their branches supply arterial blood to the heart; these arteries originated from the aorta just above the aortic valve leaflets, the heart has high metabolic requirement, extracting approximately 70% to 80% of the oxygen delivered ***(Andrew, 2011).***

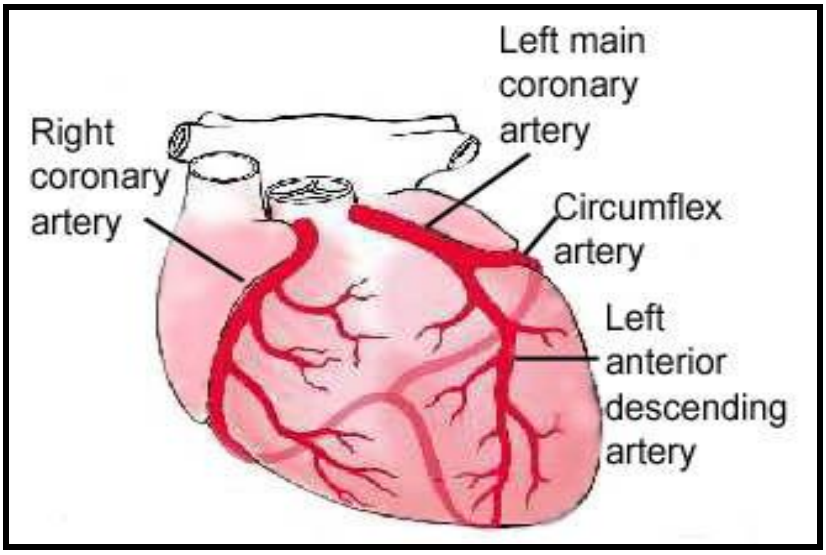


**Figure (2):** Coronary arteries ***(American Heart Association, 2012).***

The cardiac conduction system generates and transmits electrical impulses that stimulate contraction, the conduction system first stimulates contraction of the atria and then the ventricles. The synchronization of the atrial and ventricle allows the ventricles to fill completely before ventricular ejection thereby maximizing cardiac output. Properties of cardiac cells include ***automaticity***: is the ability to initiate an impulse spontaneously and continuously, ***excitability***: is the ability to be electrically stimulated, ***conductivity***: is ability to transmit an impulse along a membrane in an orderly manner, and ***contractility***: is ability to respond mechanically to an impulse ***(Lewis, Heitkemper, & Dickerson, 2011).***

A normal cardiac impulse begins in the ***sinoatrial node (SAN)*** in the upper right atrium which located in the wall of the right atrium between the openings for the inferior and superior vena cava. Its spread over the atrial myocardium via intraatrial pathways ***(Bachmann's bundle)*** and intranodal pathways which causing atrial contraction. The impulse then travels to the ***atrioventricular node (AVN)*** (which located in the septum between the atria and ventricle) through the ***bundle of Hiss*** and down the left and right bundle branches. It ends in the ***Purkinji*** fibers, which transmit the impulse to the ventricles and the healthy heart beats in normal sinus rhythm ***(NSR)*** at ***60 to 100*** Beats per Minutes ***(BPM) (Lewis et al., 2011).***

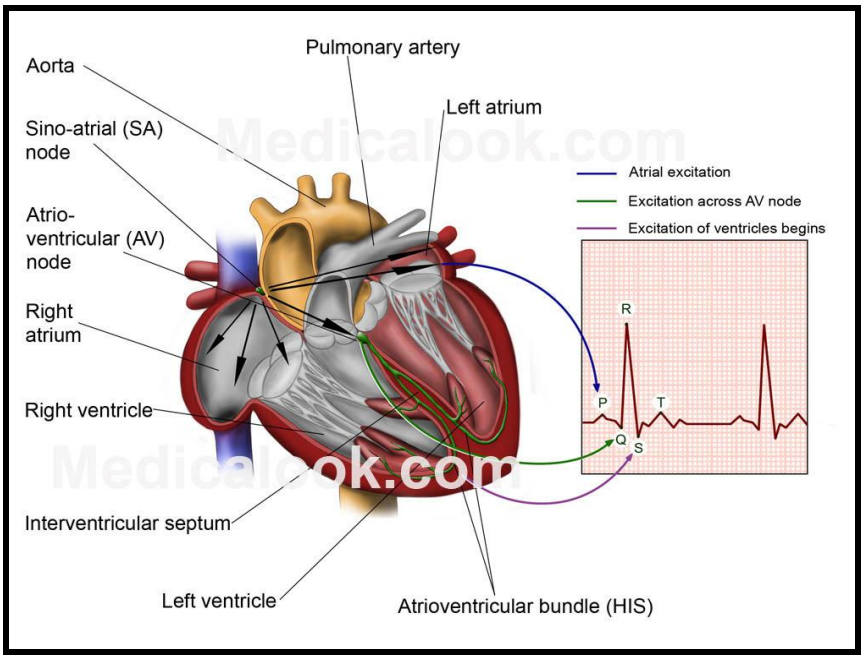


**Figure (3):** Conduction system of the heart
***(American Heart Association, 2012).***

The autonomic nervous system plays an important role in the rate of impulse formation, the speed of conduction and the strength of cardiac contraction. The components of the autonomic nervous system that affect the heart rate, the vagus nerve fibers of the para sympathetic nervous system and nerve fibers of the sympathetic nervous system, stimulation of the vagus nerve causes a decreased rate of firing of the SA node and causes slowing of impulse conduction of AV node. Stimulation of the sympathetic nerves increases SA node firing, AV node impulse conduction, and cardiac contractility ***(Ignatavicuis & Workman, 2010).***

The SA node fails to produce an electrical impulse, the AV node will initiate impulses at 40 to 60 beats per minute. Neither the SA node nor the AV node is functioning; the ventricles will initiate impulses at a slower rate. When there is disruption of the normal electrical conduction in the heart, abnormal heart rhythm occurs. This is called an arrhythmias or dysrhythmias ***(Lewis et al., 2011).***

***Phipps, Monahan, Sands, Marek, & Neighbors, (2011)*** mentioned that the conduction system of the heart may be altered or interrupted at any point by degenerative disease, drugs, surgical trauma. This may cause syncope, diminished cardiac output, hypotension, and dysrhythmias, partial or complete heart block and sinus bradycardia, patients with these conditions may be treated by artificial pacing to correct atrial and ventricular dysrhythmias and to treat chronic atrial fibrillation.