**Emotional and Physical Rehabilitation Protocol
for Patients Undergoing Permanent Cardiac
Pacemaker Implantation**

**Entisar Mohammed Mahmud Abu-Salem, Dr. Sorayia Ramadan Abdel El-Fatah, Dr. Namat Alla Gomaa Ahmed, Dr. Amal Elias Abdel-Aziz**

Faculty of Nursing - Ain Shams University

**ABSTRACT**

**The aim** of the study was to investigate the effect ofemotional and physical rehabilitation protocol for patients undergoing permanent cardiac pacemaker implantation. **This study** used a quasi experimental design. **The study** was carried out at the inpatient and outpatient cardiac clinic, in Nasr City Health Insurance Hospital. All patients undergoing permanent cardiac pacemaker implantation at Nasr City Health Insurance Hospital were (the target of this study). **The tools** used for data collection were:Taylor Manifest Anxiety scale to measure the degree of anxiety regarding to patient’s permanent pacemaker implantation, Beck Depression Inventory Scale to measure the degree of depression regarding to patient’s permanent pacemaker implantation and questionnaire to assessing the physical needs for patients undergoing permanent cardiac pacemaker implantation. **The main findings** of the study were: There no statistically significant difference between control and study groups before rehabilitation protocol implementation. It inconsistent, the present study findings revealed that there was highly statistically significant difference between control and study groups after rehabilitation protocol implementation regarding emotional and physical needs for patients undergoing permanent cardiac pacemaker implantation. **The study recommended,** conduction of further studies in order to assess the effectiveness of emotional and physical rehabilitation protocol applications on patients' outcome regarding different cardiac disorders with replication of this study on a larger probability sample from different geographical locations at the Arab Republic of Egypt.

**INTRODUCTION**

The use of pacemaker therapy in the clinical management of persons with heart disease is rapidly growing. More than 500,000 persons in the United States have had a permanent pacemaker implanted, and more than 100,000 new pacemakers are implanted each year. Pacemakers were originally developed for use in emergency situations to aid cardiopulmonary resuscitation efforts. One of the earliest experimental pacemakers was developed in the 1930s; it consisted of a flashlight battery to provide an electrical power source, a mechanical timer to regulate the frequency of the electrical discharge, and a switch to allow control of the duration of each burst of electrical current. In the 1930s, cardiac resuscitation was highly controversial, and this early work never proceeded significantly past the experimental stage. Twenty years later, in the 1950s, definitive progress was made in the development of a permanent implantable pacemaker ***(Shaffer, 2011).***

Normally the heart generates its own electrical currents allowing it to beat at various rates according to the daily needs. There are some situations in which the heart may be unable to adjust the rate resulting in a slow heart beat or may show blocks in the pathways through which the current flows (heart blocks). Conventionally, this problem has been overcome by using small battery operated devices, called artificial pacemakers which stimulate the heart ***(Kusumoto & Goldschlger, 2011).***

Artificial cardiac pacemakers are defined as an electronic device that delivers electrical stimulation to the heart. They are utilized in the treatment of cardiac bradycardias and tachycardias that are caused by an alteration in the normal electrical pathways in the heart ***(Wilkoff, 2010).*** Also, ***Eli & Serge (2011)*** mentioned that an artificial pacemaker is a small, battery-powered device designed to work with the heart to help the body get the oxygen-rich blood it needs. 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.

Pacemaker implantation is a safe procedure. Procedural complications are rare, but do occur. These include but are not limited to: 5% chance of bleeding or severe bruising at the insertion site. 1% chance of lung puncture while obtaining access into the veins. The lung when punctured can deflate like a balloon. This usually requires insertion of a tube in the side of the chest to reinflate the lung. The lung then heals up in five to seven days. 1% chance of puncture of heart muscle. This may require specific treatment. 1% chance of infection. Other risks may apply, depending upon the patient's general condition and other medical conditions that he might have. Some discomfort is usual at the implant site; however this is usually easily controllable with simple pain killers ***(Kutalek & Maquilan, 2012).***

Regarding pacemaker complications, Beatriz, Jorge, ***Ramon & Lozano (2009)*** mentioned that pacemakers may occasionally sense and respond to outside signals that have nothing to do with demands on the heart, such as electrical activity in the muscles of the chest. Feelings of dizziness or lightheadedness may indicate that the device is not working properly and should be reported to the doctor. Other complications that may arise include pacemaker pocket infection, the main symptom of which is redness and tenderness at the site of the pocket. Such infection occurs in only about 2 percent of cases.

The mind, or psyche, is usually defined as the part of the person consisting of the thoughts, the feelings and the function of willing as a basis for understanding the abnormal. All nurses must know what constitutes mental as well as physical health ***(Haddad, 2010).***

Intense emotions such as anxiety, anger, elation and depression are accompanied by predictable increases in heart rate and blood pressure. The interaction of heart and psyche is bi-directional ***(Kawachi, 2009).*** According to ***Scheier (2011)*** emotions and stressful experiences affect the heart directly through the autonomic nervous system, and indirectly through neuro-endocrine pathways. Clinicians dating back to Sir William Osier have observed that a surprising number of coronary heart disease (CHD) patients seem to be compulsive, driven, overachievers, and are unable to relax and quick to feel angry and frustrated when things do not proceed as planned.

The high volume, high cost & variation in care associated with cardiovascular diseases and procedures evoked cardiac rehabilitation, also known as cardiac rehab which are management plans that display goals for patients and provide maximize physical, psychological and social functioning to enable people with cardiac disease to lead fulfilling lives with confidence,and introduce and encourage behaviors that may minimize the risk of further cardiac events and conditions ***(Hofmann, 2011).*** ***Rasmussen, & Gengler, (2012)*** added that the cardiac rehabilitation are: Facilitate and shorten the period of recovery after an acute cardiac event, promote strategies for achieving mutually agreed goals of ongoing prevention, develop and maintain skills for long-term behavior change and self-management and promote appropriate use of health and community services, including concordance with prescribed medications and professional advice.

The psychiatric nurse needs also to evaluate systems other than somatic systems of the patient to arrive at a proper nursing diagnosis. Problems in the doctor-patient or nurse-patient relationship or in the family or other social systems involving the patient, may present as depression or anxiety ***(Norris and Grove, 2012).***

So the nurses have a key role in all aspects of rehabilitation phases. Participating in the assessment of patient's physical/psychological condition it is the initial phase of rehabilitation occurs during the inpatient stage. Nurses are also responsible for initiating the rehabilitation on appropriate patients and ensuring that the various events occur as planned. In some care settings or conditions, case managers who are advanced practice nurses providing educational and psychological support to reduce anxiety, depression and hospital readmission rate; in others, phase three of cardiac rehabilitation involves more independent and group exercise. The final phase of rehabilitation is independent and ongoing conditioning ***(Bare & Smeltzer, 2010).***

**AIM OF THE STUDY**

This study aims to investigate the effect ofemotional and physical rehabilitation protocol for patients undergoing permanent cardiac pacemaker implantation.

It was achieved through:

1. Assessing the emotional and physical needs for patients undergoing permanent cardiac pacemaker implantation
2. Accordingly, developing an emotional and physical rehabilitation protocol
3. Implementing the emotional and physical rehabilitation protocol
4. Investigating the effects of emotional and physical rehabilitation protocol on patients undergoing permanent cardiac pacemaker implantation after implementing the intervention protocol.
5. Reassessing the emotional and physical needs for Group A: study group and Group B: Control group after 2 months from permanent cardiac pacemaker implantation.

**Research Hypothesis**

It is supposed that the emotional and physical rehabilitation protocol will have a positive effect on patients with permanent cardiac pacemaker implantation

**SUBJECTS & METHODS**

1. **Technical Design**
* **Research Design:**

A quasi-experimental research design was used to find out the effect of emotional and physical rehabilitation protocol on patients with permanent cardiac pacemaker implantation.

* **Setting**

The study was carried out at the inpatient and outpatient cardiac clinics, in Nasr City Health Insurance Hospital. Nasr City Health Insurance Hospital in El-Taiaran street, Nasr City, Cairo. Its hospital capacity is 250 beds. Which receive more than 1534 cardiac patients from different diagnosis annually, 100 of them requiring cardiac pacing ***(Reports of Statistical Administration and Medical Records Department at Coronary Care Department. 2012).***

* **Sample:**

The subjects of the present study will include all available patients undergoing permanent cardiac pacemaker implantation as a convenience sample along 6 months period in this period came 70 patients they were classified into two groups according to all criteria: control group (35 patients) and study group (35 patients).

* **Tools of data collection**

The following tools were used for data collection:

1. Taylor Manifest Anxiety scale: this scale used to measure the degree of anxiety regarding to patient’s permanent pacemaker implantation (Appendix I).
2. Beck Depression Inventory Scale: this scale used to measure the degree of depression regarding to patient’s permanent pacemaker implantation (Appendix II).
3. Questionnaire to assessing the physical needs for patients undergoing permanent cardiac pacemaker implantation. (Appendix III).

 It consists of four sections:

1. The first section socio- demographic and medical data sheet
2. The second section Pre/Post knowledge questionnaire sheet
3. The third section Observational checklist
4. The fourth section rehabilitation assessment sheet

**Face & Content validity:**

Validity of tools was done by a group of experts to check the relevancy, clarity, comprehensiveness, and applicability of the questions. According to their opinions, minor modification was done and the final form was developed. Face and content validation of the studied tools were according to opinions of the experts.

**Implementation of the rehabilitation protocol**

The rehabilitation protocol implementation consists of three phases:

1. **Preparatory phase:**

Based on result obtained from assessment tools and review of literature, the rehabilitation protocol content was developed by researcher in the form booklet.

**General objectives of booklet:**

At the end of rehabilitation protocol implementation, patients should be able to:

* Improvephysical and psychological functioning after permanent cardiac pacemaker implantation.
* Have gained information and knowledge about the permanent cardiac pacemaker
* Introduce and encourage behaviors that may minimize the risk of further cardiac events and conditions

**Specific objectives:**

At the end of rehabilitation protocol implementation, patients should be able to:

* Identify concept ofpermanent cardiac pacemaker.
* Facilitate and shorten the period of recovery after permanent cardiac pacemaker implantation.
* Promote strategies for achieving mutually agreed goals of ongoing prevention.
* Develop and maintain skills for long-term behavior change andSelf-management.
* Promote appropriate use of health and community services including concordance with prescribed medications and professional advice.
* Adopt positive attitude towardpermanent cardiac pacemaker.
1. **Operational design:**

The operational design describes the pilot study, and field work

 **Pilot study:**

 After the tools have been designed, they were tested through a pilot study, which was done before embarking on the field work to check the clarity and feasibility of designed tools and to estimate the time needed to complete its items. It was carried out on 7 patients, who were not excluded from the main study sample. According to the result of the pilot study, no change was required.

**Field work:**

 The field work included the patients undergoing permanent cardiac pacemaker implantation during 6 months from (October 2013 to April 2014).they consists of 70 patients. The patients were classified into two groups: control group (35 patients) and study group (35 patients).

1. **Administration Design:**

An official letter requesting permission to conduct the study will be submitted from the Dean of the Faculty of Nursing, Ain Shams University to all hospital directors and head managers in charge. This letter will include the aim of the study and a photocopy from the data collection tools in order to get the permission and cooperation in the collection of data from patients with permanent implanted cardiac pacemakers.

* **Ethical consideration:**

Before conducting the study patients were assured that data will be collected from questionnaires will remain confidential. The researcher must assure voluntary participation for every selected patient who will involve on the study sample.The researcher must clarify to the patient that all information will be used for scientific reasons only.The developed protocol will be distributed on both groups to generalize the benefits of all participants.

1. **Statistical Design**

The collected data were organized, coded, computerized, tabulated and analyzed by using the SPSS software (statistical package for social sciences version 11.0). Descriptive statistics were applied (e.g. mean, standard deviation, frequency, percentage). Tests of significance were performed to test the study hypotheses (i.e. Paired and unpaired t- test, chi square test and ANOVA test) were used to test the significant of some variances. A significant level value was considered when p < 0.05. The smaller the P- value obtained, the more significant is the result: the P- value being the probability of error of the conclusion.

**RESULTS**

**Table (1):** Socio-demographic Characteristics of the Study & Control Group Subjects (n=70).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Variables** | **Study Group** | **Control Group** | **X2** | **P value** |
| **No** | **%** | **No** | **%** |
| **Gender:** |
| Male | 20 | 57.1 | 18 | 51.4 | .00 | 1.00 NS |
| Female | 15 | 42.9 | 17 | 48.6 |
| **Age:** |
| 20 < 40 | 4 | 11.4 | 6 | 17.1 | .00 | 1.00NS |
| 40<60 | 6 | 17.1 | 7 | 20 |
| Above 60 | 25 | 71.4 | 22 | 62.9 |
| Mean+ SD | 59 +13.4 | 57+ 16.03 |
| **Level of Education:** |
| Illiterate | 10 | 28.6 | 9 | 25.7 | .000 | 1.00NS |
| Read& write | 4 | 11.4 | 6 | 17.1 |
| Primary  | 2 | 5.7 | 2 | 5.7 |
| Preparatory | 1 | 2.9 | 2 | 5.7 |
| Secondary | 7 | 20 | 6 | 17.1 |
| Higher Education | 11 | 31.4 | 10 | 28.6 |
| **Occupation:** |
| Employee | 6 | 17.1 | 7 | 20 | .81 | .93NS |
| Farmer | 4 | 11.4 | 4 | 11.4 |
| Housewife | 13 | 37.1 | 13 | 37.1 |
| Worker | 6 | 17.1 | 7 | 20 |
| Retired | 6 | 17.1 | 4 | 11.4 |
| **Place of Residence:** |
| Rural | 18 | 51.4 | 16 | 45.7 | .067 | 1.00NS |
| Urban | 17 | 48.6 | 19 | 54.3 |
| **Marital Status:** |
| Single | 4 | 11.4 | 4 | 11.4 | 1.1 | .57NS |
| Married | 31 | 88.6 | 30 | 85.7 |
| Widow | 0 | 0 | 1 | 2.9 |
| **Smoking Habit:** |
| Smoking | 11 | 31.4 | 13 | 37.1 | .37 | .54NS |
| No Smoking | 24 | 68.6 | 22 | 62.9 |
| **Having A car:** |
| Yes | 14 | 40 | 8 | 22.9 | 3.7 | .05NS |
| No  | 21 | 60 | 27 | 77.1 |
| **Driving a car:** |
| Yes  | 11 | 31.4 | 8 | 22.9 | 1.1 | .27NS |
| No  | 24 | 68.6 | 27 | 77.1 |
| **Watch Orientation:** |
| Yes  | 27 | 77.1 | 26 | 74.3 | .16 | .68NS |
| No  | 8 | 22.9 | 9 | 25.7 |

Table (1) shows that, 57.1 &51.4 percent of the study &control group were males and the other 48.6&42.9 percent were females. The majority (71.4 &62.9%) of the study & control group were found in the age group over 60 years old with a mean of (59 + 13.4 & 57 + 16.03 respectively).

Regarding level of education 31.4 and 28.6 percent of the study & control group subjects were higher education, and 28.6 & 25.7 percent of the study &control group were having illiterate, whereas 20 & 17.1% of the study &control group subjects were having read and write & secondary school education.

 Regarding occupation, the pervious table illustrates that (37.1%) of the study &control group subjects were housewives, and (17.1% &20%) of study &control groups were worker, retired & employee respectively and (11.4%) of the study & control group were farmers Also this table revealed that 48.6% & 54.3% of the study & control group subjects were come from urban areas while 51.4% &45.7% were come from rural areas for the study & control group respectively. Regarding marital status majority (85.7%) of the study &control group subjects were married.

As regards smoker this table denoted that (68.6% &62.9%) of the study &control group subjects were non smokers. The pervious table revealed that (60% & 77.1%) of the study &control group subjects were haven't a car, and (68.6% &77.1%) of the study & control group subjects were haven't the ability to drive a car.

As regards watch orientation, this table shows that, majority of the study &control group subjects (77.1% &74.3%) were having the ability for watch orientation.

**Table (2):** Frequency and severity of depression among patients pre/post implantation and in the study and control groups.

|  |  |  |
| --- | --- | --- |
| **Depression** | **Pre/ (n=70)** | **Post/ (n=70)** |
| **Study group****(n= 35)** | **Control****Group****(n= 35)** |
| No | % | No | % | No | % |
| Non | 5 | 7.2% | 33 | 94.3% | 2 | 5.7% |
| Mild | 26 | 37.1% | 2 | 5.7% | 20 | 57.1% |
| Moderate | 39 | 55.7% | 0 | 0.0% | 13 | 37.1% |
| Severe | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Depression: Absent Present  | 565 | 7.2%92.9% | 332 | 94.3%5.7% | 233 | 5.7%94.3 |
| Mean | 28.5 | 1.7 | 28.3 |
| SD | 4.1 | 1.0 | 4.0 |
| T test | T | P | t | P | t | P |
| 20.8 | < 0.01 | 2.1 | < 0.05 | 17.8 | < 0.01 |

The presence and severity of depression was compared between patient’s pre /post implantation.

 As shown in table 2, more than half of the patients (55.7%) respectively were moderate depressed pre implantation and by compared between study group (94.3%) were not depressed and control group (57.1%) were depressed

This difference was statistically significant, p <0.01. As for the severity of depression, it was mostly mild to moderate among patients pre implantation and in control group, 94.3% respectively.

**Table (3):** Frequency and severity of anxiety among patients pre/post implantation and in the study and control groups.

|  |  |  |
| --- | --- | --- |
| **Anxiety level** | **Pre/(n=70)** | **Post/(n=70)**  |
| **Study****Group****(n= 35)** | **Control****Group****(n= 35)** |
| No | % | No | % | No | % |
| No  | 9 | 12.9% | 31 | 88.6% | 1 | 2.9% |
| Mild anxiety | 29 | 41.4% | 4 | 11.4% | 19 | 54.3% |
|  moderate anxiety  | 27 | 38.6% | 0 | 0.0% | 13 | 37.1% |
|  sever anxiety | 5 | 7.1% | 0 | 0.0% | 2 | 5.7% |
|  Anxiety level:AbsentPresent  |  961 |  12.9%87.1% | 31 4 |  88.6% 11.4% |  134 |   2.9% 97.1% |
| Mean | 27.7 | 2.8 | 28.8 |
| SD | 3.3 | 1.0 | 4.0 |
| T test | T | P | T | P | T | P |
| 15.4 | < 0.01 | 0.2 | > 0.05 | 12.7 | < 0.01 |

(\*) Statistically significant at p<0.05

The presence and severity of anxiety was compared between patient’s pre /post implantation.

As shown in table3, more than third of the patients (41.4%)had mild anxiety pre implantation, whereas (54.3%)of the control group had mild anxiety whereas majority (88.6%) of the study group had no anxiety. This difference was statistically significant, p <0.05.

**Table (4):** Rehabilitation assessment Score Levels Among the Study and Control Group Subjects during Different Assessment Periods (n=70):

|  |  |  |  |
| --- | --- | --- | --- |
| **Mean + SD** | **X2 /p value** | **Level of Assessment** | **Level****Assessment** **Period**  |
| **Unsatisfactory****< 7** | **Satisfactory****7-9** |
| % | No | % | No | **Group** |
| 5.16 + 0.641.03 + 1.15 | 45.60.000\* | 8.688.6 | 331 | 91.411.4 | 324 | Before dischargeStudy Group Control Group |
| 5.16 + 0.641.03 + 1.27 | 45.60.000\* | 8.682.9 | 329 | 91.417.1 | 326 | Follow up Study GroupControl Group |

\* Significant at the p < 0.05 probability level NS= not statistically significant

This table shows that, 91.4 % respectively of study group have satisfactory level of rehabilitation assessment before discharge and in the follow up visit while, 8.6% &88.6% respectively of the study and control group have unsatisfactory level of practice regarding rehabilitation assessment before discharge and in the follow up visit with highly statistical differences between the study and control group during the periods of before discharge and follow up assessments periods

**Table (5):** Correlation between Rehabilitation and total Knowledge Scores among the Two Studied Groups (n=70)

|  |  |
| --- | --- |
| **Item** | **total Knowledge** |
| **study group (N=35)** | **control group (N=35)** |
| **R Value** | **P Value** | **SIG** | **R Value** | **P Value** | **SIG** |
| Rehabilitation | 0.37 | <0.05 | S | 0.19 | <0.05 | NS |

\* Significant at p<.05.

This table revealed there is statistical significant positive correlation between Rehabilitation

and total knowledge scores among study and control group subjects.

**Table (6):** Correlation between Rehabilitation and Practice Scores among the Study Group (n=35)

|  |  |
| --- | --- |
| **Item** | **Practice** |
| **study group (N=35)** |
| **R Value** | **P Value** | **SIG** |
| Rehabilitation | 0.35 | <0.05 | S |

\* Significant at p<.05.

This table revealed there is statistical significant positive correlation between Rehabilitation and Practice among study subjects.

**DISCUSSION**

**As regards to sociodemographic:**

The present study delineated more than one half of the study sample were male and female subjects among study and control group and the majority of the study sample age was above 60 years old, 31.4% percent of the study sample was high education, more than one third of the study sample were housewives, more than one half of the study sample were come from rural areas, the majority of the study sample were married and nonsmokers and having the ability for watch orientation.

In this regard ***Shen (2011):*** stated in study under title of: Survival and functional independence after implantation of a permanent pacemaker, he followed 157 patients treated with cardiac pacing, including 80 men, for a mean of five years. [***Lamas***](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Lamas%20GA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)***,*** [***Orav,***](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Orav%20EJ%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus) [***Stambler***](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Stambler%20BS%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)***,*** [***Ellenbogen,***](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Ellenbogen%20KA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus) ***(2010)*** studied of life and clinical outcomes in elderly patients treated with ventricular pacing as compared with dual-chamber pacing: Pacemaker Selection in the Elderly investigators, found the average age of the patients was 76 years (range, 65 to 96), and 60 percent were men.

***Nicola, Klaus & Elisabeth (2011)*** studied fatal complications of pacemaker and implantable cardioverter-defibrillator implantation: medical malpractice? And found of the 27,730 cases reviewed, 11 fatalities connected with pacemaker implantation. The average age in patients with pacemaker implantation was 74.0 years (age range 65–87 years). Six patients were male (average age 71.7 years) and five female (average age 76.2 years) and seven patients were smokers.

Also, [***Horvat***](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Horvat%20D%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus) ***(2011)*** studied the first seven years of implantation of permanent cardiac pacemakers in a small urban community in central Croatia a sample of 211 operations were included in the study. There were 121 (57.3%) male patients, mean age 69.7 years, and 90 (42.7%) female patients, mean age 74.5 years.

The current study also revealed that approximately sixty& 62.9 percentage of the study and control group were having complete heart block as a cause for pacemaker insertion and twenty percent of the study group was having heart failure and more than one third of the study and control group were having single chamber pacemaker.

**As regards to psychological status:**

The current study results delineated that, a higher statistically significant difference between the two studied groups in anxiety and depression.

**Ι. Depression symptoms and their relation to personal characteristics**

The presence and severity of depression was compared between the study and control groups had different levels of depression more than half of the patients (92.9%) respectively were depressed pre implantation and by compared between study group (5.7%) were depressed and control group (94.3%) were depressed.

Also the relation between the presence of depression among control subjects and their socio-demographic characteristics could be revealed with any of their characteristics.

These findings agree with ***Pratt et al. (2010)*** who found that depression increased the frequency of heart disease over 15 years.

This also agrees with ***Frasure-Smith et al. (2012)*** who found that depression has been shown to be present in the majority of patients admitted for pacemaker implantation.

It is supported by ***Zeigelstein, (2011)*** who has also found that post pacemaker implantation depression is common.

**II. Anxiety symptoms and their relation to personal characteristics**

The present study revealed that the severity of Anxiety was compared between the study and control groups 11.4% of the study group had mild anxiety, whereas (97.1%), for the control group had mild to moderate anxiety.

These findings are convenient with **Friedman, (2009)** who reported that a major cardiac event evokes feelings of anxiety, with initial concerns about diagnosis and treatment and later concerns about the impact of impaired health on role and relationships. It is also consistent with ***(Nickel et al., 2011)*** who found that patients with heart block had significantly higher prevalence of anxiety. Also, ***Paterniti et al. (2011)*** found that there is increase evidence that anxiety, especially panic attacks and anger may also predict the occurrence of heart block.

This consistency of the present study with other studies may be because all the samples were from the out patients cardiac clinic. Where the cardiac patient suffers a disruption of autonomic and emotional regulation due to the uncertainty surrounding his illness, its treatment and its issues of dependency and limitation of activity.

**As Regards Patient's rehabilitation:**

In the present study, psychological preparation typically is given before pacemaker implantation to facilitate the patient’s adaptation and recovery. Patients who received emotional and physical rehabilitation protocol demonstrated improvement in their psychological status than patients in the control group. Statistically highly significant difference between pre insertion and before discharge post pacing in depression and anxiety for the study group.

Also, the current study revealed that, there was a significant statistical positive correlation between total knowledge and total practices scores with rehabilitation among the study and control group subjects throughout the different assessment periods.

**Conclusion**

The findings of the present study, it can be concluded that, patients who were exposed to emotional and physical Rehabilitation protocol showed a relative improvement in their emotional and physical conditions than those who were exposed to the routine hospital care only. This improvement was manifested in the shortened length of hospital stay, the empirical support for reducing anxiety and depression, hypothesis the decrement in the number of complications developed and increment in the post total mean knowledge scores, post total mean practice scores as regards to the immediate, life-long and follow up instructions.

**Recommendations**

Based on the findings of the study results and conclusions, in relation to the effect ofemotional and physical rehabilitation protocol for patients undergoing permanent cardiac pacemaker implantation the following recommendations are suggested:

Recommendations related to patients:

1. All patients with cardiac pacemakers and their families should receive adequate knowledge and skills necessary for helping their patients to live with his/her artificial pacemakers.
2. Establishment of patients' educational centers in hospitals equipped by suitable related materials, medias and audio-visual aids for teaching all cardiac pacemakers patients' how to live with their device.
3. Pacemaker club can be established and encouraged.
4. Establishment of a hot line contact for trouble shooting of the dangerous situations that might be suddenly arises.
5. Regular training session for all patients with permanent pacemakers to teach them how to measure their vital signs to detect complications early.

Recommendations for health team personnel and hospital administrator:

1. Provision of seminars and workshops to raise health team personnel and hospital administrators' awareness about benefits of emotional and physical rehabilitation for their provision of care and debate on replacing traditional care with collaborative ones.
2. Establishment of a committee from social worker, physician, nurses and patient relatives to facilitate health insurance procedure.

Recommendations for furthers researches:

1. Replication of the study on a larger probability sample selected from different geographical areas in Egypt is recommended to obtain more generalizable data.
2. Further studies have to be carried out in order to assess the effectiveness of emotional and physical rehabilitation protocol applications on patients' outcomes regarding different cardiac disorders.
3. Further studies have to be carried out in order to assess nurses' knowledge and practices regarding care of artificial cardiac pacemakers.

**REFERENCES**

**Bare, B., & Smeltzer, S. (2010):** Medical Surgical Nursing. Philadelphia: Lippincott Williams & Wilkins. (9th.ed. p. 629- 633).

**Beatriz, F., Jorge, T., Ramon, A., & Lozano, F. (2009)**: Pacemaker Lead Displacement: Mechanisms and Management. Indian Pacing Electrophysiology. Journal 3(4), p. 231-238.

**Eli, O., & Serge, B. (2011):** Drug Induced Bradycardia: To Pace or Not to Pace? Pacing Clinical Electrophysiology; Volume 27(8): P. 1144-1147.

**Frasure-Smith, N., Lesperance, F., Prince, R., Verrier, P., Garber, R., Juneau, M (2012):** Randomised trial of home-based psychosocial nursing intervention for patients recovering from cardiac pacing. Lancet; 350: p. 473-9.

**Friedman, M. (2009):** Stressors and perceived stress in older women with heart disease, Cardiovascular Nursing, Volume 29, Number 4, p. 25-29.

 **Haddad, H., & Gyal, G. (2010):** Cardiac rehabilitation after implantation of permanent cardiac pacemakers. Volume 260 P. 945-950.

**Hofmann, P. (2011):** Critical path method: an important tool for coordinating clinical care. Journal of Quality Improvement; 19; 235–246.

[**Horvat, D**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Horvat%20D%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**. (2011):** The first seven years of implantation of permanent cardiac pacemakers in a small urban community in central Croatia. Acta Clincal Croatia. 47(4): pp. 227-230.

 **Kawachi, I., Colditz, G., & Ascheria, A. (2009):** Prospective study of phobic anxiety and risk of heart disease in men, Circulation, Volume 89, P. 1992-1997.

**Kusumoto, F., & Goldschlager, N. (2011):** Cardiac pacing. New England Journal of Medicine.; 334:89-97.

**Kutalek, S., & Maquilan, J. (2012):** Approach to generator change. In: Ellenbogen, K.A., Kay, G.N. & Wilkoff, B.L, Clinical Cardiac Pacing. [**Lamas G.,A**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Lamas%20GA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,** [**Orav E.J**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Orav%20EJ%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,** [**Stambler B.S**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Stambler%20BS%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,** [**Ellenbogen, K.A**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Ellenbogen%20KA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,(2010):** Quality of life and clinical outcomes in elderly patients treated with ventricular pacing as compared with dual-chamber pacing. Pacemaker Selection in the Elderly investigators. New England Journal of Medicine.16;338 (16):1097-1104.Philadelphia: WB Saunders. p. 523- 537

[**Lamas G.,A**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Lamas%20GA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,** [**Orav E.J**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Orav%20EJ%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,** [**Stambler B.S**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Stambler%20BS%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,** [**Ellenbogen, K.A**](http://www.ncbi.nlm.nih.gov/sites/entrez?Db=pubmed&Cmd=Search&Term=%22Ellenbogen%20KA%22%5BAuthor%5D&itool=EntrezSystem2.PEntrez.Pubmed.Pubmed_ResultsPanel.Pubmed_DiscoveryPanel.Pubmed_RVAbstractPlus)**.,(2010):** Quality of life and clinical outcomes in elderly patients treated with ventricular pacing as compared with dual-chamber pacing. Pacemaker Selection in the Elderly investigators. New England Journal of Medicine.16;338 (16):1097-1104.

**Nicola, S., Klaus, P., & Elisabeth, E. (2011):** Fatal complications of pacemaker and implantable cardioverter-defibrillator implantation: medical malpractice? Journal of [European Association of Cardio-Thoracic Surgery](http://icvts.ctsnetjournals.org/misc/terms.dtl); Volume 8:444-448

**Nickel, J., Brown, K., & Smith, B. (2011):** Depression and anxiety among chronically ill heart patients: age differences in risk and predictors, Research of Nursing Health, Volume 13, Number 2, P. 87-97.

**Norris, L., and Grove, S. (2012):** Investigation of selected psychosocial needs of family members of critically ill adult patients, Heart and Lung, Volume 15, pp. 194.

**Paterniti, S., Zureik, M., Ducimetiere, P., Touboul, P., & Feve, J. (2011):** Sustained anxiety and 4-year progression of carotid atherosclerosis, Arteriosclerosis and vascular Biology, Volume 21, Number 1, p. 136-141.

**Pratt, L., Ford, D., & Crum, R. (2010):** Depression, Psychiatric medication, and risk of cardiac pacemaker: Prospective data from the Baltimore ECA follow up, Circulation, Volume 94, p. 3123-3129.

**Rasmussen, N., & Gengler,T. (2012):** Clinical rehabilitation of care: the route to better communication. Nursing; 24: pp. 47–49.

**Scheier, W. (2011):** Psychological effects of training in coronary patients circulation volume 8. P. 234-244.

**Shaffer, R. (2011):** Keeping pace with permanent pacemakers. Dimensions of Critical Care Nursing.18(6):p. 2-8.

**Shen, W. (2011):** Survival and functional independence after implantation of a permanent pacemaker in octogenarians and nonagenarians: A population- based study. Annals of Internal Medicine.15 (125): p. 476-480.

**Wilkoff, B. (2010):** Pacemaker and ICD malfunction: An incomplete picture. Journal of American Medical Association 26; pp. 295:44-46.

**Ziegelstein, R., Fauerbach, J., and Stevens, S. (2011):** Patients with depression are less likely to follow recommendations to reduce cardiac risk during recovery from cardiac pacing, Archives of Internal Medicine, Volume 160, p. 1818-1823.