Impact of a Designed Nursing Intervention protocol on Myocardial Infarction Patient's Outcome at a selected University Hospital in Egypt

Abdelhameed MahrosAbdelhameed[1*], Warda Youssef Mohamed[2],
Yousria Abd El-salam Seloma[3], Hanan El-sayed Zaghla[4],

1. Clinical Instructor of Critical Care and Emergency Nursing, Faculty of Nursing,
2. Prof. of Critical care and Emergency Nursing, Faculty of Nursing,
3. Lecturer of Critical Care and Emergency Nursing, Faculty of Nursing,
4. Lecturer of Critical Care medicine Faculty of Medicine,
   * E-mail of the corresponding author: abdelhameedmahros@yahoo.com

Abstract

Background: Myocardial infarction is a life threatening disease that influences the physical, psychological and social dimensions of the individual. Improper lifestyle is one of the causes of this disease. The designing and implementing of nursing intervention protocol for MI patients could be one of the important and fundamental steps in improving MI patients outcomes. **Aim**: The aim of this study was to examine the impact of a designed nursing intervention protocol on myocardial infarction patient's outcomes as indicated by higher post total mean knowledge scores, higher post total mean practices scores and high level of compliance to lifelong instruction. **Research hypotheses:** H_1. Patients who will be exposed to a designed nursing intervention protocol will have a higher post total mean knowledge scores; H_2. Patients who will be exposed to a designed nursing intervention protocol will have a higher post total mean practices scores; H_3. Patients who will be exposed to a designed nursing intervention protocol will have a high level of compliance to lifelong instruction. **Design:** A quasi-experimental research design was utilized in this study **Sample:** A convenience sample of 40 adult male and female MI patients. **Setting**: The cardiac care units at a selected Cairo University Hospital were recruited to fulfill the aim of this study. **Tools**: Four tools were formulated& tested to collect data pertinent to the study; Socio-demographic and medical data sheet, Pre/Post knowledge questionnaire sheet, an Observational checklist and Compliance assessment sheet. Structured interview, reviewing medical records and direct observation were utilized for data collection. **Results:** The study results revealed that the post total mean knowledge scores of the studied subjects is increased significantly with value of t= 20.6 at p=0.000, higher post total practice scores among the studied subjects with t& p values (t=5.6 at p= 0.000) also, studied subjects had mild to high compliance level regarding the lifelong instructions. **Conclusion:** It can be concluded that, enrichment of patients' knowledge and practices in relation to their condition and utilization of the effective nursing intervention protocol as an approach of care could have a positive impact upon improvement of patients' outcome. **Recommendations:** The study recommended Conduction of further studies in order to assess the effectiveness of the designed protocol 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, in addition to establishment of cardiac rehabilitation center in the different heath care organizations.
Keywards: Nursing intervention protocol, Myocardial Infarction, Outcomes, Cardiac care units.

1. Introduction

One of the goals of nursing care is health promotion and prevention of disease. Cardiac rehabilitation achieves these goals as it a comprehensive program that prepares the patient to full, vital and productive life in the termination imposed on him by the cardiac disease. It is a process for restoring and maintaining a patient at his optimal physiological, psychological, and social status. Patient moves from complete dependence to independence in his activities of daily living (ADL) (Nair, 2009).

The pattern of coronary care has changed, as having treatment philosophies, early hospital discharge is a major force. Supervised programs of exercise, education and lifestyle changes have improved outcome for client who have coronary artery disease, myocardial infarction (MI), and other severe cardiovascular conditions (Hoeman, 2002). Gulanick & Mayers (2011) added, The American Heart Association and American College of cardiology have developed treatment guidelines for patients with unstable angina and Non ST segment elevation Myocardial infarction, as well as for ST segment elevation myocardial infarction. Each guidelines addresses initial and ongoing drug therapy, indication for fibrinolytic and Percutaneous coronary interventions, and discharge consideration. For patient with MI, the therapeutic goals are to establish reperfusion, to reduce infarct size, to prevent and treat complications, and to provide emotional support and education. Recovery from unstable angina is shorter than with myocardial infarction because only ischemic, not infracted, tissue occurs. More than 85% of patients experiencing

myocardial infarction return to full activity level.

Ackley, Ladwig, Swan &Tucher (2009) reported that, Cardiac disease self-management are personal actions to manage heart disease and prevent disease progression which are; report symptoms of worsening disease; performs treatment regimen as prescribed; limits sodium intake; follows recommended diet; participates in smoking cessation program; participates in recommended exercise program and uses warming signs to seek health care.

Trials have established that several types of intervention can reduce the risk factors for cardiovascular disease; improve psychosocial well-being, and patient knowledge; and reduce morbidity and mortality (Hanestad, Hanssen & Nordrehaug , 2004).

Nurses should provide the patient with an exercise instruction such as instructing the patient to record his heart rate before and after each phase of exercise and whenever he feels anything unusual during and after each exercise. Patient may increase speed of walking day by day, and increase the length of walking distance. At the end of 6-8 weeks patient should be able to engage in brisk walking for 5km/hr. patient may be advised to avoid static exercise (lifting, carrying, pushing heavy objects)(Nair 2009).

In Egypt, cardiac rehabilitation, usually, is not a part of the routine patient care after acute myocardial infarction, so The designing and implementing of nursing intervention protocol for MI patients could be one of the important and fundamental steps in improving MI patients outcomes.

2. Significance of the study

From clinical observation in the cardiac care and critical care units, it was observed that the number of patients with ACS has increased over the last years and these patients require intensive collaborative care to save their lives and they are at risk for several consequences. These consequences in turn may have negative impact on the patient's physical and psychological condition, and will prolong patient's hospital stay, and increase hospital costs, That is why there is an interest to conduct such type of research which might safeguard this category of patients against these serious consequences, In addition, scattered researches where done in this area especially on the national level.

Furthermore, this research could provide health professionals with an in depth understanding related to this category of patients which could be reflected positively on the quality of patients' life, The study as well could support the important role of the nurse in the patients' care through assessing the patient's and providing the required care and teaching regarding the myocardial infarction, Also it is hoped that findings of this study might help in improving quality of patient care and establish evidence based data that can promote nursing practice and research.

3. Aim of the study

The aim of the study is to assess the impact of nursing intervention protocol on myocardial infarction patient's outcomes at the cardiac care units- Cairo University hospitals.

4. Research hypotheses

To fulfill the aim of this study, the following research hypotheses were formulated:

H_1. Patients who will be exposed to the nursing intervention protocol will have a higher post total mean knowledge scores.

H_2. Patients who will be exposed to the nursing intervention protocol will have a higher post total mean practices scores.

H_3. Patients who will be exposed to the nursing intervention protocol plan will have a high level of compliance to medication regimen, diet, exercises, and follows up appointments.

5. Subjects and Methods:

5.1 Research Design

A quasi-experimental research design was utilized in this study

5.2 Setting

This study was carried out at the cardiac care units affiliated to Cairo University Hospitals, in Cairo governorate. It is one of the largest educational university hospitals in Egypt in this field. It receives the cardiac patients all over the day. It receives more than 150 MI patients per year.

5.3 Subjects

A convenient sample of 40 adult male and female patients admitted to cardiac care units at Cairo university hospitals with acute myocardial infarction for the first time and willing to participate in the study.

5.4 Tools

Four tools were developed to collect data pertinent to the study. These tools are:

1-Sociodemographic and medical data sheet (Appendix A):it is a sheet covering two main sections: the first section is related to sociodemographic data which includes age, gender, occupation, marital status, level of education, socioeconomic level, nutritional habits, smoking habits etc. and The second section covers medical data such as date of admission and discharge, diagnosis, vital signs, past medical history& co-morbidities such as diabetes, hypertension), routine medications, family history, and body mass index

2- Pre/Post knowledge questionnaire sheet (Appendix B): This sheet was formulated to assess patients' knowledge about risk factors, manifestations, treatment, complications of acute myocardial infarction, warning signs of recurrent attacks, activities, and life style modifications….etc.

3- Observational checklist (Appendix C): This sheet was developed to assess patient's practices regarding patients' ability to practice peripheral pulse counting, relaxation technique; deep breathing technique and filling a diet record.

4- Compliance assessment sheet (Appendix D):This sheet was designed to evaluate subjects' adherence to the prescribed regimen. It includes six main areas including a) adherence to the life-long post discharge instructions; b) adherence to prescribed follow up system; c) adherence to prescribed medications regimen; d) adherence to prescribed diet regimen; e) adherence to prescribed exercise regimen and f) adherence to stress management techniques. It is a rating scale which is composed of 4 points (always, sometimes, rarely and never).

Ethical consideration

An official permission to conduct the study was obtained from the ethical committee of research and Vice Dean for Higher Education and Research- Faculty of Nursing and directors of Critical Care Units. Verbal consents were obtained from head nurses of these units. In addition, patients' agreements to be included in the study were obtained formally after explanation of the nature and purpose of the study. Each patient was free to either participate or not in this study and have the right to withdraw from the study at any time without any rational; also, patients were informed that data will not be included in any further researches without another new consent if they do not mind. Confidentiality and anonymity of each subject were assured through coding of all data.

5.6 Techniques for data collections

Structured interview, reviewing medical /nursing records ,direct patients observation and follow up by phone calls were utilized to fill out the study tools.

5.7 Procedure

The current study was carried out on two phases, designation and implementation phases which are:

5.7.1 Designing phase:

It was concerned with the construction and preparation of the different data collection tools and instructional booklet in addition to obtaining managerial arrangement to carry out the study.

5.7.2 Implementation phase:

The researchers visited the cardiac care units on daily bases once they find the patient who met the criteria of selection; socio-demographic and medical data sheet (tool 1) was fulfilled. As well the knowledge assessment sheet (tool 2) and observational checklist sheet (tool 3) were filled out for the whole group as a control group. The whole group was exposed to the routine hospital care. Then the whole group was subjected to the designed nursing intervention protocol on a daily base till discharge as a study group. Then all subjects were supplied with the predetermined instructional booklet. The compliance assessment sheet (tool 4) was filled out for all subjects during the first month after discharge. Mainly follow up was done through the open channel of communication with the investigator through the telephone call to answer their questions, reinforce information, correct misunderstanding and monitor the patient's adherence to the given instructions.

5.8 Statistical data analysis

Data obtained from the study tools were categorized, tabulated, analyzed and data entry was performed using the SPSS software (statistical package for social sciences version20.0). Descriptive statistics were applied (e.g. mean, standard deviation, frequency and percentage). Tests of significance were performed to test the study hypotheses (i.e. paired and unpaired t- test, chi square test and ANOVA test). Pearson's correlation coefficient was applied between quantitative variables. A significant level value was considered when $p \leq 0.05$.The smaller the P- value obtained, the more significant is the result. The P- value is being the probability of error of the conclusion.

6. Results

Findings of the current study are presented in three main sections; section (1) related to socio-demographic data, medical data (table1 and figures1,2,3,4,5,6,7&8), section (2) is concerned with testing the research hypothesis (figure 9,10&11) and section (3) is concerned with the additional findings(table2&3)

Section 1:

Figure (1) shows that, 52.5 % of study sample's age ranged from>50 to65 years, and 37.5% of them were aged between 35to50 years. Figure (2) shows that, more than three fourths of the studied subjects (78 %) were males. Figure (3) shows that, 85% of studied subjects came from urban areas and figure (4) shows that (40%) of the studied subjects were overweight and 30% were moderate obese. Figures (5)& (6) shows that, (72.5%) of the studied subjects were smokers and (37.9%) of them were smoking 10 to 20 cigarettes per day. In addition that, figure (7) shows that more than half (55%) of the studied subjects were diagnosed as STEMI while (44%)of them diagnosed NSTEM and figure(8) shows that (37.5%) of them have not any co-morbidity diseases.

Table (1) revealed that more than one third (37.5%) of the studied subjects were able to read and write and (80%) of them were having a work. In addition that, (47.5%) of the studied subjects were used to eat foundry and fatty diet and (72.5%) dose not drink coffee.(97.5%) of the studied subjects does not practice any sports. Finally only (15%) of the studied subjects has positive family history for the cardiac disease.

Section (2):

Figure (9) indicating higher total knowledge scores among the studied subjects, ranked as satisfactory to good levels. However, all of the studied subjects (100%) remained with an unsatisfactory knowledge level before receiving the designed protocol which is supporting the first hypothesis which stated "Patients who will be exposed to a designed nursing intervention protocol will have a higher post total mean knowledge scores". Figure (10) shows that (100%) were having unsatisfactory level of practice before receiving the designed protocol, this percentage decreased to be (45%)after receiving the designed protocol, the other (55%) of the studied subjects were having satisfactory (25%) and good (30%)level of practice and this is supporting the second hypothesis which stated "Patients who will be exposed to a designed nursing intervention protocol will have a higher post total mean practices scores". finally, it appears from figure(11)that, (50%) of the studied subjects has medium total compliance level to the lifelong instructions, while (47.5%) of them has low level of total compliance, and shows also the different subtotal compliance scores ranking from low to high level of compliance which could partially support the third hypothesis which stated "Patients who will be exposed to a designed nursing intervention protocol will have a high level of compliance to lifelong instruction".

Section (3)

Table (2) revealed that, there is a significant positive statistical correlations between total knowledge scores and total practice scores, total practice scores and total compliance scores and total compliance scores and total knowledge scores (r = 0.569, p =0.000), (r =0.509, p =0.001) and (r=0.338 ,p=0.033) respectively.

Table (3) Demonstrates that, there is a highly significant statistical difference was found between educational level and total mean knowledge, practice and compliance scores of the studied subjects.

7. Discussion

The present study delineated that more than three fourths of the cases are male and more than half of the study sample's age ranged between >50-65 years old. This agreed with Bare, Cheever, Hinkle & Smeltzer (2010) who mentioned that risk factors for the development of coronary artery diseases "CAD" increases with age and male gender. In accordance with these results, Bos-Scheap, Hautvast, Heestermans, Wit &Umans (2011) reported in a published study entitled as "Nursing role to improve care to infarct patients and patients undergoing heart surgery" that (75%) were male. This study results is similar to the study of Angerud ,Brulin , Eliasson & Naslund (2013) in an analysis of 4266 MI patient which revealed that about two third of the studied subjects were male with mean age of 61.8 years, and Hawboldt, Pearce & Young (2010) in a study on 346 MI patients found that, their mean age was 65.3 years and 65.5% of them were male. Moreover, Ahrens, Klinpell & Prentice (2010) found that ACS is more prevalent in older persons than in younger persons, the condition develops earlier in men than in women. Holle, Kirchberger, Kuch, Meisinger, Seidl& Wende (2010) also confirmed that aged patients have a high prevalence of MI.

The study results also supported by the results of Hawboldt, Pearce& Young (2010) which studied 346 MI patients, showed that the mean age of patients was 65.4 years and almost two-thirds were male. Another study done by Eliasson, Isaksson ,Jansson , Lundblad , Naslund& Zingmark (2011) studied 8630 with a first MI and showed that about three fourths of the studied subjects were male with mean age of 55.5 years. In contrast with our study, the study of Aurigemma, Chiriboga, Fornasini, Goldberg, Gore, Lessard, Spencer& Yarzebski (2009) that studied 6334 MI patients showed that the mean age of the studied subjects was 71 years and 56% were men.

The demographic data of present study also delineated that the majority of the studied subjects came from urban areas. As Cairo University hospitals is one of the largest educational university hospitals in Egypt in this field which receives the cardiac patients from all over the country. This may be due to the unhealthy lifestyle which the urban people have comparing to the rural people lifestyle. This study results is similar to the

study of Angerud ,Brulin, Eliasson & Naslund (2013) in an analysis of 4266 MI patient which revealed that about two thirds of the studied subjects came from urban areas.

The present study revealed that about three fourths of the study subjects were smokers, that is why, smoking may be the most probable risk factor for the majority of MI events. This is agreed with Gulanick & Mayers (2011) who reported that smoking causes vasoconstriction and reduces myocardial oxygen supply , risk for developing CAD is 2 to 6 times greater in cigarette smokers and risk is proportional to number of cigarettes smoked. However the study carried out by Angerud , Brulin , Eliasson & Naslund (2013) showed that about one third only of the study subjects which was 4266 MI patients were smokers.In accordance to this study, the study of Eliasson, Isaksson , Jansson , Lundblad , Näslund & Zingmark (2011) which studied 8630 with a first MI and showed that 39.6% of the study subjects were smokers.Moreover, Hawboldt, Pearce & Young (2010) found that more than one third of the studied subjects (346 MI patients) were current smokers.

The reviewed medical data sheet of current study subjects showed that more than half of them were diagnosed STEMI. This result is similar to the results of Aurigemma, Chiriboga, Fornasini, Goldberg, Gore, Lessard, Spencer& Yarzebski (2009) study titled "Contemporary trends in evidence-based treatment for acute myocardial infarction" which showed that the majority of the studied subjects were STEMI. In contrast with this study the study of Young, Hawboldt & Pearce (2010) which studied 346 MI patients found that, the majority of the study subjects diagnosed NSTEMI.

Regarding BMI the current study showed that more than one third of the studied subjects were overweight and more than one forth of them were obese, That's why, the obesity may be one of the risk factors for MI. In this regards, Brubaker, Kaminsy& Whaley (2002) reported that obesity is documented in approximately 40% of people with CAD patients. In accordance with these results, Bucholz, Chan, Jone, Rathore, Krumholz, Reid, Rich& Spertus (2012) in a study titled "Body mass index and mortality in acute myocardial infarction patients" done on study sample 6359 MI patients reported that one third of the studied subjects were obese.

Regarding the co-morbidities the current study revealed that co-morbidities was absent in one third of the study subjects, while almost one fourths of the studied subjects had hypertension plus diabetes mellitus and one fifth of the studied subjects had diabetes mellitus only. Gulanick & Mayers (2011) also mentioned that eighty percent of diabetic patients have cardiovascular disease. In addition that High blood pressure is major risk factor for CAD as Nair (2009) reported that the stress of constantly elevated blood pressure can increase the rate of atherosclerosis development. In this regard, Aurigemma, Chiriboga, Fornasini, Goldberg, Gore, Lessard, Spencer& Yarzebski (2009) reported that about one third of the study sample haven't any co-morbidities, while more than one fourth of the study sample had had 1-2 co-morbidities and about one third of them had 3-4 co-morbidities. Also Bucholz et al. (2012) reported in a study done on 6359 MI patients that around two- thirds of the sample had hypertension, and more than one third of them had diabetes mellitus. Moreover, Hawboldt, Pearce & Young (2010) found that more than one fourth of their study subjects had had diabetes mellitus, while more than half of them had hypertension.

As regards to the Patient's Knowledge, the current study results delineated, a higher statistically significant difference between patient's knowledge score pre and post exposure to the designed protocol, indicating higher total and subtotal mean post knowledge scores among the studied subjects, ranked as satisfactory to good levels. However, all of the studied subjects were having an unsatisfactory knowledge level before receiving the designed protocol. The rational for knowledge improvement might be related to the provision of educational booklet and / or verbal instructional information. Also, the curiosity of the studied subjects as this is the first heart attack for them and many concerns are present. Results of present study showed that there was a significant difference before and after the intervention in the studied subjects. Therefore, applying discharge plan could have positive effects on the lifestyle of patients with MI.

Similar to the results of this research, another study by Jiang, Sit& Wong (2007) indicated that, a nurse-led cardiac rehabilitation program can significantly improve the health behaviors and cardiac physiological risk factors in coronary heart disease patients. Based on these findings, it is necessary to consider the role of nurses in a cardiac rehabilitation program. Dalleck, Lueker& Schmidt (2011) reported that, participation in cardiac rehabilitation programs had positive changes in various risk factors like blood pressure, cholesterol, triglyceride, HDL and LDL cholesterol 17,18 energy expenditure, fat, and stress. Following up the client's behavior at home helped better controlling the heart disease. This reduced the frequency of their re-hospitalization, cost of hospitalization and mortality rate.

Franklin, Gordon Leighton& Salmon (2002) also showed a reduction in risk factors of patients with MI, CABG, Percutaneous coronary intervention, or angina after participating in traditional cardiac rehabilitation, cardiac rehabilitation with physician supervision, and a community-based exercise program run by exercise physiologists. In addition, Abedi, Ahmadi, Arefi ,Faghihi-zadeh& Ghofranipour (2005) reported that, continuous care model has positive effects on the quality of life of patients after CABG and heart failure, in all physical,

emotional and general dimensions. This model was effective in the reduction of the hospitalization period and chest pain in patients with coronary vascular diseases.

However, the study carried out by Hosseini, Mohammadi, Rahgozar& Taherian (2006) aiming to determine the effect of applying cardiac rehabilitation at home on the quality of life of patients with MI showed that the rehabilitation program consisting of training sessions regarding MI disease and its complications, dietary and medicinal regime, risk factors of the disease, etc. at home had no particular effect on various dimensions of the quality of life of this group of patients and there was no significant difference between groups. Ghahramanian, Golchin& Rostami (2011) showed that, education programs and follow-up by telephone have positive effects on knowledge, self-care behaviors, a disease symptoms of patients with cardiac failure. Patients forget the therapeutic recommendations gradually after discharge from the hospital; therefore, it is necessary to provide such information. On the other hand, the number of healthy undesirable behaviors of patients with MI increases if it is not followed-up at home. Since the patients' participation in cardiac rehabilitation programs after an acute MI is low, they require education and follow-up regarding the control of symptoms, medicinal information, and improvement of lifestyle.

Chris &Charlie (2004) agreed with this findings as they studied the "Influence of written information on patient's knowledge of their diagnosis" on 64 patients in Oxford University found that patients receiving an information sheet were twice as likely to be correct with their main diagnosis (59% vs 31%) compared with the control group. There was a tendency for patients receiving a sheet to have increased knowledge of previous medical problems. Finally, patients receiving a sheet were significantly more satisfied with the information given about their diagnosis in hospital compared with the control group.

As regards to the relationship between knowledge and educational level, the current study revealed that there was significant statistical correlation between educational level and mean knowledge scores among studied subjects. In this regard, Alghanim & Alnaif (2009) agreed with our findings in a published research article entitled as "patients' knowledge and attitudes towards health education: implications for primary health care services" in Saudi Arabia in which they found, respondents with a higher level of education had a significantly higher mean score (3.63) of knowledge about diabetes than those with a lower level of education (3.28) (t-test = 3.665, p<0.001). Contradicting this, Seloma (2010) reported in an unpublished doctorate thesis entitled as" Impact of utilization of a designed nursing clinical pathway guidelines on the patients' outcomes with cardiac pacing at the critical care units, El-Manial University Hospital" that there was no significant statistical correlation between educational level and mean knowledge scores among study and control group subjects throughout the different assessment periods except during assessment period before pacemaker insertion.

As regards to patient's practice, the current study results reported that there was a significant statistical difference between patient's practice mean scores pre and post exposure to the designed protocol, the majority of study subjects had higher post total and subtotal mean practice scores, ranked as satisfactory to good levels. However, all of the studied subjects had an unsatisfactory practice scores before receiving the designed protocol .These findings may be as a result of continuous demonstration, redemonestration, follow up and practical content of the instructional booklet which was given to the studied subjects with the continuous explanations, reinforcement and feedback.

In the present study, there was a significant statistical correlation between patients mean practices scores and their level of education in different assessment periods among studied subjects before and after the intervention. In addition to, there was a significant statistical positive correlation between total knowledge and total practices scores among the studied subjects. Contradicting this, Seloma (2010) reported that there was no significant statistical correlation between patients mean practices scores and their level of education in different assessment periods among study and control group subjects. However, there was a significant statistical positive correlation between total knowledge and total practices scores among the study and control group subjects throughout the different assessment periods.

In accordance with the study findings, Refaii (2010) in an unpublished doctorate thesis entitled as "the impact of a designed nursing clinical pathway guidelines on acute myocardial infarction patients' outcomes" on 60 patients (30 study and 30 control) at Benha University Hospitals in Egypt found that, an increment of study group post mean practices scores as compared to control group after implementation of a designed nursing clinical pathway with a highly significant statistical differences between the two groups during the two follow up assessment (immediately post and three months later) with the following X^2 &p values(X^2 =21.72 at p=0.001 & X^2 = 4.158 at p =0.001 respectively). As well, El Hadary (2009) in an unpublished doctorate found that there was a higher statistically significant difference between the study and control group subjects in different assessment periods, indicating higher mean values of avoiding cardiac stress activities, climbing stairs as advised and arranging activity/rest time throughout the follow up visits among the study group as compared to the control group ones, with high significant statistical differences between them (F= 25.14 at p=0.0001, F=53.39 at p=0.0001&F=30.70 at p=0.0001).Moreover, Mohamed (2006) in a study entitled as" effect of counseling on

patient's compliance with therapeutic regimen after artificial valvular heart replacement surgery" on 100 patients at the cardiothoracic surgery department at Ain Shams University hospital in Egypt, in an unpublished doctorate thesis found that, none of the patients in the study and control groups were performing radial pulse measuring, neck, shoulder and elbow exercises pre-program implementation. However post program implementation; approximately one third had satisfactory performance, with a highly significant statistical difference between study and control group subjects

As regards to patient's compliance, the current study indicated a statistically significant difference between the studied subjects regarding to total and subtotal compliance scores post discharge and during follow up visits. The studied subjects showed different levels of compliance ranging between being low, medium and high compliance levels. This may be due to continuous contact with the studied subjects through open channel of telephone communication between the researcher and the studied subjects. Wal, Jaarsma, Moser&Veeger (2006) mentioned that in order to improve compliance, an increment of knowledge and a change of patient's beliefs by education and counseling are recommended. Extra attention should be paid to patients with depressive symptoms.

In this regard, El Hadary (2009) supported these result when reporting that study group subjects showed a higher mean compliance scores regarding following prescribed medications and following prescribed activity regimen as compared to control group subjects with significant statistical differences between the two studied groups (F=25.60at p=0.0001& F= 69.02 at p= 0.0001).Also, Wal, Jaarsma, Moser&Veeger (2006) in a published research article entitled as "Compliance in heart failure patients: the importance of knowledge and belief" in University of Groningen, data were collected in a cohort of 501 heart failure patients. They found that overall compliance was 72% in this older heart failure population. Compliance with medication and appointment keeping was high (>90%). In contrast, compliance with diet (83%), fluid restriction (73%), exercise (39%), and weighing (35%) was markedly lower. Compliance was related to knowledge (OR=5.67; CI 2.87-11.19), beliefs (OR=1.78; CI 1.18-2.69), and depressive symptoms (OR=0.53; CI 0.35-0.78). Adding to that, Zerwic (2007) stated that, the compliance to the therapeutic regimen was promoted by nursing clarification and explanation. Therefore, the information provided through nursing intervention must be sufficient to increase patient's desire and encourage them to comply with prescribed therapeutic regimen after discharge. The patient who are oriented with every-thing about their disease are more likely to engage in activities that promote changing their behaviors, promote physical well-being and enhancing the compliance with therapeutic regimen than those who are not oriented.

8. Conclusion

Considering the results of the present study and the available evidence, it can be concluded that, patients who were exposed to the designed nursing protocol for the myocardial infarction patients showed a relative improvement in their conditions than those who were exposed to the routine hospital care only. This improvement was manifested in the increment in the post total mean knowledge scores, post total mean practice scores and the mean compliance scores as regards to the immediate, life-long and follow up instructions. Rehabilitation centers also could apply this model to follow the patients after MI.

9. Recommendations

Based on the findings of the present study, the following recommendations are suggested:

Recommendations related to patients:

- Establishment of patients' educational centers in hospitals equipped by suitable related materials, medias and audio-visual aids for teaching all myocardial infarction patients' how to live with their medical condition.
- Cardiac rehabilitation centers can be established and encouraged.
- Regular follow up for all patients with myocardial infarction to evaluate their health conditions and to detect complications early.

Recommendations for furthers researches:

- Replication of the study on a larger probability sample selected from different geographical areas in Egypt is recommended to obtain more generalizable data.
- Further studies have to be carried out in order to assess the effectiveness of nursing intervention protocol applications on patients' outcomes regarding different cardiac disorders.
- Further studies have to be carried out in order to assess nurses' knowledge and practices regarding providing a nursing intervention protocol for myocardial infarction patients.

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(A) Figures

Figure (1): Distribution of the Studied Patients Regarding their Age (n=40).
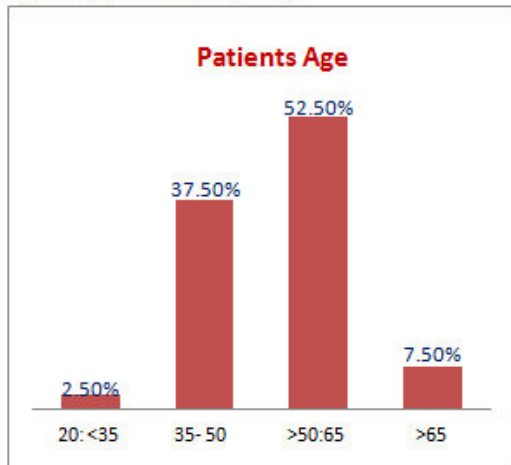

Figure (2): Distribution of the Studied Patients in Relation to Gender (n=40).
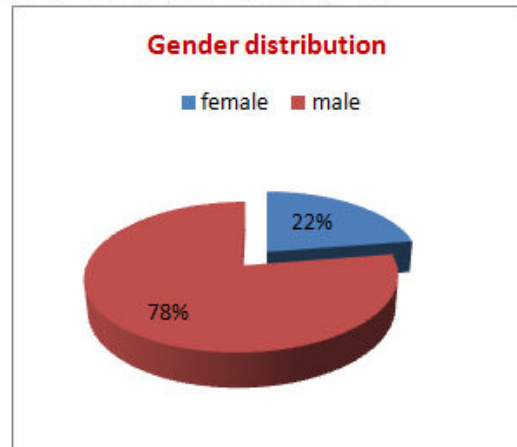

Figure (3): Distribution of the studied subjects in relation to place of residence (n=40).
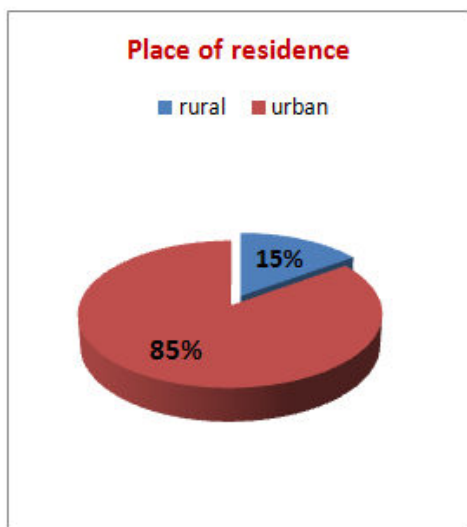

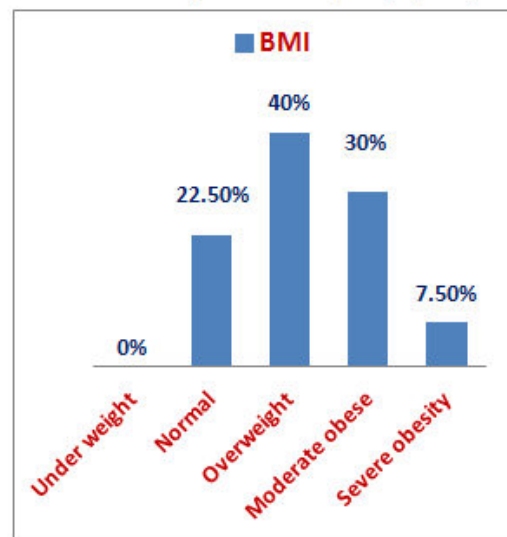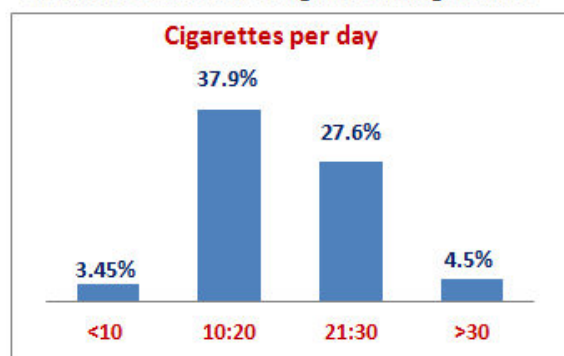**Figure (4): Distribution of the studied subjects in relation to body mass index (BMI) (n=40).**

Figure (5): Distribution of the studied subjects in relation to smoking (n=40).

Figure (6): Distribution of the studied subjects in relation to number of cigarettes being smoked

Figure (7): Distribution of the studied subjects in relation to Diagnosis (n=40).
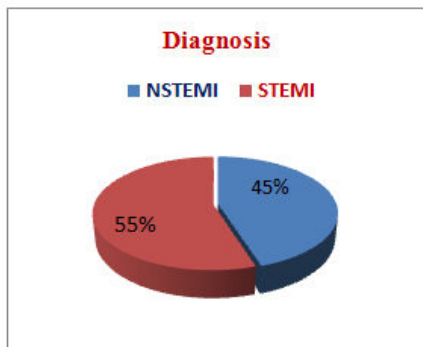

Figure (8): Distribution of the studied subjects in relation to co-morbidities (n=40).
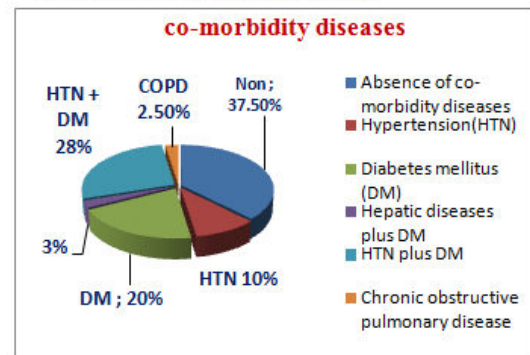

Figure (9): Differences in total knowledge scores of the studied subjects' pre and post receiving the designed protocol (n= 40):
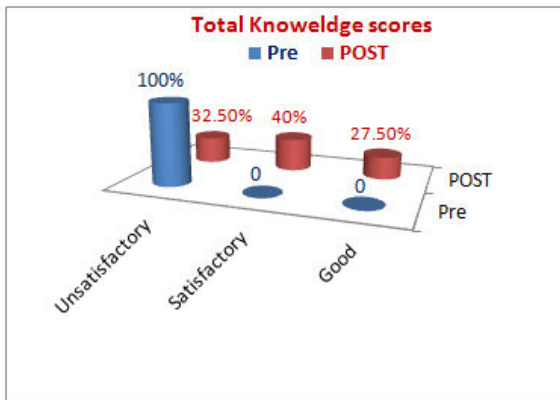

Figure (10): Differences in total practice scores of the studied subjects' pre and post receiving the designed protocol (n= 40):
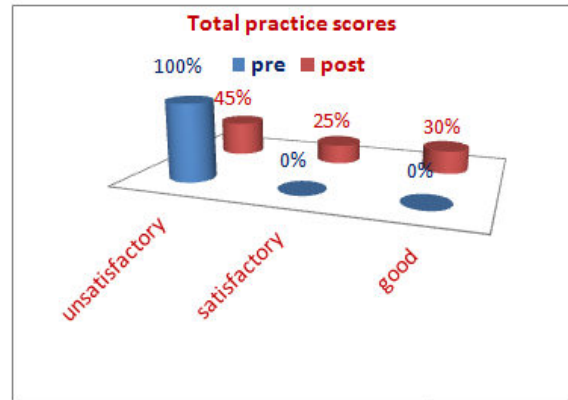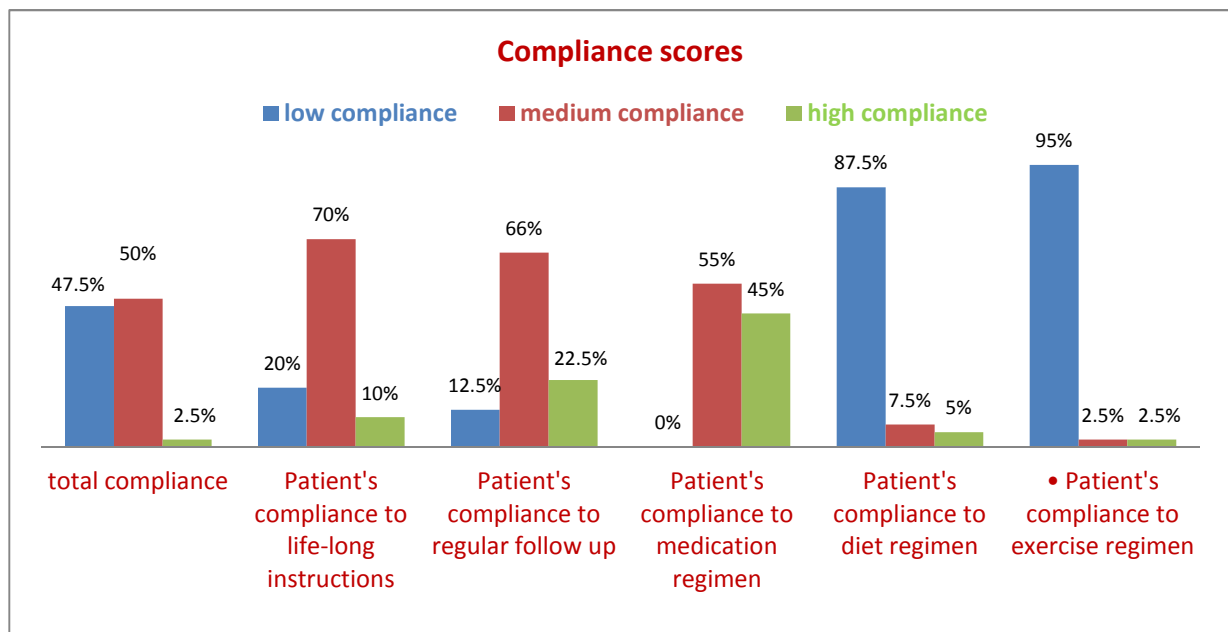

Figure (11): Differences in total and subtotal compliance score levels of the studied subjects' post receiving the designed protocol (n=40):

(B) Tables:

Table (1): Distribution of the educational level, Occupation, Diet nature, Coffee intake, practicing sports and family history for cardiac diseases for the studied subjects (n=40).

Items		No	%
Educational level	- Illiterate	7	17.5
	- Can read and write	15	37.5
	- Secondary education	12	30.0
	- High education	6	15.0
Occupation	- Doesn't work	8	20.0
	- Worker/ Employer	32	80.0
Diet nature	- Low salt	2	5
	- Low fat	1	2.5
	- Foundry and fatty	19	47.5
	- Not specific" usual"	19	45
Coffee intake	- No	29	72.5
	- Yes	11	27.5
Practice sports	- No	39	97.5
	- Yes	1	2.5
Family history	- No	34	85.0
	- Yes	6	15.0

Table (2): Correlation Coefficient Between total knowledge scores, total practice scores, and total compliance scores of the studied subjects (n=40).

The Items	r/value	P/value
1-Total knowledge scores and total practice scores	0.569	0.000*
2- Total practice scores and total compliance scores	0.509	0.001*
3- Total compliance scores and total knowledge scores	0.338	0.033*

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

Table (3): One way ANOVA test for comparison of total mean knowledge scores, total mean practice score and total mean compliance scores in relation to educational Level of the Studied Subjects (n=40).

Variable	f	p
• Educational level		
o Educational level/ total mean knowledge scores	10.1	0.000*
o Educational level/ total mean practice scores	5.3	0.005*
o Educational level/ total mean compliance scores	4.2	0.011*

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

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