

## Factors Affecting Nurses' Performance Regarding Thrombolytic Therapy among Patients with Acute Myocardial Infarction

Samah Mohamed Mohamed<sup>(1)</sup>, Nadia Mohamed Taha<sup>(2)</sup>, Naglaa Abd Elkareem Moghazy<sup>(3)</sup> & Zeinab Mohamed Ahmed<sup>(4)</sup>

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

### Abstract

**Background:** The productivity and care quality provided by health care employees are closely related to their performance within health care organization. Therefore, it was essential to determine factors have an effect on the professional nurses' efficiency if the quality of health care delivery was to be enhanced. **Aim of the study:** identify characteristics influencing nurse's performance in administering thrombolytic therapy among patients suffering from acute myocardial infarction in cardiac care units at Hospitals of Zagazig University. **Subjects and Methods: Research design:** exploring design was utilized. **Subjects:** All available nurses who work in intensive cardiac care units at Hospitals of Zagazig University and their total number was 70 nurse **Tools of data collection: Tool I:** An questionnaire for interviews to assess socio-demographic data and knowledge of nurses, **Tool II :** Checklist of observations to assess nurses practices, and **Tool III:** Factors affecting nurses' performance. **Results:** The age range of the nurses studied varied from 20-50 years with median 30 years, and 82.9% of studied nurses were females. Regarding nurses qualification 40% of nurses had diploma in nursing sciences and 65.7% of nurses hadn't attended any training course regarding caring of AMI patients and thrombolytic therapy. The majority (91.4%) of nurses' performance was influenced by patients, nurses, and work related issues. **Conclusion:** The majority of studied nurses reported that their performance was influenced by nurses, patients, and work related issues. **Recommendation:** The training program should be geared in particular to the younger nurses with short duration of experience for caring patient with acute myocardial infarction

**Keywords:** Nurses' performance, Thrombolytic therapy, acute myocardial infarction, Affecting Factors

### Introduction

Nurses are caregivers it is a job that must be done conscientiously and correctly because it may cause the loss of a person's life. Thence, nurses' performance is a fundamental component of ensuring that people receive excellent care and that it is delivered promptly when it is required. Nurses' performance varies depending on the type of resources and facilities gettable; it also differs from developed countries to developing countries. Performance is the vital component of the organization development and growth the performance factors are

different and greatly affect work out put<sup>(1)</sup>.

These factors can be grouped under three domains nurses, patients and work related factors. First, nurses related factors: Qualified nurses play a pivotal role in the ubiquitous provision of health care. Factors related to nurses that affecting the performance including: nurses age, gender, relationship status, level of education, academic degree ,years of expertise, Managerial position/ authority, personality, abilities, skills, and motivation<sup>(2)</sup>. Psychological factors that

include psychological demand, balance between duties and career, family, and social time, manage the work, social and colleagues support, particularly quality of leadership, work rewards and job security<sup>(3)</sup>.

Another aspect that contributed to the growth of nurses' skills was their age; senior nurses were found to have more work experience and hence better results. Nurses who were older and had more professional experiences were considered to be more competent<sup>(4)</sup>. The capacity to think critically was a helpful component in the reinforcement of nursing competency and benefited nurses in providing safe nursing care to patients. An improvement in critical thinking ability that is consistent with a rise in the nurse's competency level<sup>(5)</sup>.

Nursing personnel with a high level of job complacency are paramount for high quality care, as evaluated by the patients. Besides, positive working relation, sufficient staffing, management support are the associated requirements in attaining it, which has a momentous effect on nurse competence.

Nurse job satisfaction is a main aim for all administrators, and it is very likely determinate by a comparison of job expectations and perceived job experience. As well, in hospitals with a robust organisational culture, high job satisfaction among nurses positively affects patient outcomes<sup>(6)</sup>. Nurses are the most important human resource component in healthcare firms, and their efficiency has a directly impact on healthcare production<sup>(7)</sup>.

### Significance of the study

Cardiovascular illnesses account for almost one-third of all fatalities worldwide, with ischemic heart disease accounting for 7.5 million of them

(IHD). The (ACS) and unexpected death are the leading causes of IHD-related mortality, accounting for 1.8 million deaths each year<sup>(8)</sup>. In Egypt, a nationally representative study reported an overall prevalence of Coronary Heart Disease (CHD) of 8.3% (8.9% for woman and 8.0% for men)<sup>(9)</sup>. When provided within two hours after the onset of symptoms, early reperfusion using thrombolytic therapy has been found to reduce mortality by up to 50%. Thrombolytic Therapy is the most often used reperfusion technique (74%) in the treatment of Acute MI<sup>(10)</sup>. Nurses play an important role in health-care delivery across the world. The performance of health care employees, including professional nurses, is intimately related to the productivity and quality of treatment provided within a health care organisation. As a result, identifying factors impacting professional nurse performance was critical if the quality of health care delivery was to be improved<sup>(11)</sup>.

### Aim of the study

**The study aimed to identify** factors affecting nurses' performance regarding thrombolytic therapy among Patients with acute myocardial infarction.

### Research questions:

- 1- What factors influence nurses' performance in administering thrombolytic treatment to patients with acute myocardial infarction?

### Subject and Methods

#### Research Design:

Exploring model was used to conduct the current study.

#### Study Setting:

The present study was done in all intensive cardiac care (ICC) units at

Zagazig University Hospitals included two hospitals Sidnawi and General Medical Hospitals. The first ICC unit presented in the second floor of the heart and chest Sidnawi Hospital and others in the third and fourth floors in the same building, the number of beds are 23, and number of nurses are 40, There are also one ICC unit in the ground floor of General Medical Hospital and other in the third floor of the same building, the number of beds was 22, and the number of nurses was 30.

### Study Subjects:

A convenient sampling among all nurses who work in ICC units at Hospitals of Zagazig University included two hospitals Sidnawi and General Medical Hospitals. The first unit present in the second floor of the heart and chest Sidnawi Hospital and others in the third and fourth floor in the same building, the number of beds is 23, and number of nurses is 40, There is also one in the ground floor of General Medical Hospital and other in the third floor of the same building, the number of beds is 22, and the number of nurses is 30.

### Tools of Data Collection:

Three tools were utilized to gather the required information:

#### Tool I: A questionnaire for interviews consisted of two parts

**1- Nurses' demographic data:** this section was focused with assessment the demographic characteristic of nurses working at ICC units, it composed of 8 questions including: nurse's marital status, gender, age, residence area, educational level, years of nursing experience, number of years of cardiac care unit experience, and

attendance of training courses about care of cases suffering from acute myocardial infarction.

**2- Nurses' knowledge:** this section was designed to test nurses' knowledge of thrombolytic treatment in patients with acute myocardial infarction. It was designed by author using relevant literature Lewis et al<sup>(12)</sup>. It included 53 questions comprising the following knowledge areas:

#### A- Nurses' knowledge regarding acute myocardial infarction:

It composed of 24 multiple choice questions about myocardial infarction just like (symptoms and signs, causes, definition, types, danger elements, diagnosis, complications, treatment, and management of myocardial complications).

#### B-Nurses' knowledge regarding thrombolytic therapy:

it composed of 24 multiple choice and 5 true and false questions about thrombolytic therapy such as (definition, types, mechanism of action, indication, contraindications, side effects, preparation and precaution thrombolytic therapy administration, route of administration, onset of action, antidote of thrombolytic therapy, diagnostic tests, complications).

#### Scoring system:

The right answer received a one, while the erroneous response received a zero. The scores of the items were added together for each area of expertise, and the total score was divided by the number of items to yield a mean for the area. These scores were converted to percentages. According to data entry and statistical analysis, knowledge was regarded

adequate if the percent score was 70 % and unsatisfactory if the percent score was 70 %.

### **Tool II: An observational checklist:**

This test was used to evaluate nurses' thrombolytic treatment administration practices in patients with acute myocardial infarction, adapted from Ali et al <sup>(13)</sup>, and modified by the researcher, it included 30 steps covered the following area of practice: pre infusion phase, intra infusion phase, post infusion phase, and intravenous therapy practice: Administration of thrombolytic therapy, adopted from WHO <sup>(14)</sup>, intra infusion phase, post infusion phase.

The researcher then started the process of observation of nurse's performance using the observation checklist. This was done by the though observing the nurses while doing their usual daily work without telling them. This was done to avoid the observer bias if the nurses know that they are under observation. The process took the whole shift or sometimes more than one shift to fulfill all the sections of the observation checklist.

### **Scoring System:**

Each practice items observed to be done was scored one and this not-done scored zero. The scores of the items were added together for each area of practice and the total was divided by the number of items, yielding a mean score for the area. Based on data entry and statistical analysis, the practice was regarded good if the percent score was 70 % and unsatisfactory if the percent score was 70 %.

**Tool III: Factors affecting nurses' performance:** This part was pertained with assessing the factors

affecting nurses' performance regarding thrombolytic therapy in patients suffering from acute myocardial infarction, it adopted from (Gouda, Mohamed & ameen, 2019)<sup>(15)</sup>, (Ullah et al., 2018)<sup>(16)</sup>.

**Scoring system,** each factor considered by the nurse as affected their performance was scored one and the not affected zero. The scores for the three variables were added together and the total was divided by the number of items, yielding a mean score for the overall factors. This was transformed into a percentage score. The element was thought to have a significant impact on nurses' performance, if the percent score was 60%or more and not affected if less than 60%, this based on data entering and statistical analysis.

### **Content validity and reliability**

The data gathering tools were given to a committee of five experts from various nursing specialties after they were completed in their preliminary version. Cronbach's Alpha used to measure the internal consistency (reliability of used tool) was 0.73 for knowledge (Tool I), 0.4 for Observational Chick list for nurses' practice(Tool II). While factors that affecting nursing performance was 0.95(Tool III).

### **Field work**

After obtaining the appropriate authorization, the researcher visited with the nurses in person, explaining the purpose of the study and the data collection method, and inviting them to share. Those who gave their consent were given the a structured interview questionnaire and observational checklist were instructed in how to fill it. Each nurse spent 30 minutes on this. This study's data gathering method

spanned seven months, from the beginning of September 2019 to the end of March 2020. Three days each week, the researcher collected data from two shifts, the morning and afternoon shifts.

### **Pilot study:**

A pilot research was done on 7 nurses, who represented 10% of the full study population, to assess and confirm the clarity, applicability, and practicality of the tools, as well as to identify potential hurdles during data collection. It also aided in estimating the time required to complete the forms. Because no changes were made to the tool, participants who participated in the pilot research were included in the main study samples.

### **Administration and ethical considerations**

The research ethics commission of Zagazig University's Faculty of Nursing accepted the study procedure. Each participant was told about the nature, aim, and advantages of the study, as well as that their participation was entirely voluntary and that they had the right to withdraw from the study at any time for any reason. Besides, anonymity and particularity of the subjects were ensured by coding all data. The author stated that the information gathered would be kept private and only utilized for the purposes of the study.

The required permits were secured from hospital administrative employees by submitting an official letter from the provost of the Faculty of Nursing, Zagazig University, describing the purpose of the study in order to seek permission and help.

### **Statistical Design:**

The gathered information were categorized, collated in tables, and analyzed using SPSS software. Data were expressed in the form of frequencies and percentages for qualitative variables and means, standard deviations, and medians for quantitative variables using descriptive statistics. The chi-square test was used to compare qualitative category variables. When one of the predicted values in a 2x2 table was less than 5, the fisher exact test was employed instead. The Spearman rank correlation was utilized to analyze the interrelationships between quantitative variables and ranking variables.

### **Results:**

**Table 1:** shows the demographic features of studied nurses. It was showed that nurses' age ranged between 20-50 years with mean $\pm$  SD 30.8 $\pm$ 7.9 years, 82.9% and 15.7%, respectively of studied nurses were females and married. In regard to nurses' qualification 40% of studied nurses had diploma degree in nursing sciences. More than two third (68.6%) of the nurses studied had more than 5 years of nursing experience and 48.6% of studied nurses had more than 5 years experience in ICCU. Furthermore, 65.7% of studied nurses hadn't attended any training classes in the field of caring of patients suffering from acute MI on thrombolytic therapy.

**Table 2:** illustrates the knowledge of studied nurses regarding AMI. The findings revealed that, 82.9% and 81.4% respectively, of nurses studied had adequate understanding of the causes and risk factors of AMI, Also 60% of nurses studied had a satisfied insight of the definition of myocardial infarction. On other hand, the lowest knowledge of studied nurses were

about types of AMI (4.3%), signs and symptoms of AMI (5.7%). In general only 7.1% of nurses had adequate total knowledge regarding acute MI, whereas the majority (92.9 %) studied nurses hadn't satisfactory knowledge.

**Table 3:** shows the nurses' knowledge regarding thrombolytic therapy. The table indicated that, more than two third 70% and 67.1% (respectively) of studied nurses' had a satisfied knowledge about indications and route of administration for thrombolytic therapy, Also, 51.4% of studied nurses had satisfactory knowledge about thrombolytic therapy side effects. On other hand, lowest knowledge were about definition 7.1% and preparation 17.1% of it. In general only 17.1% of nurses had satisfactory knowledge regarding thrombolytic therapy.

**Table 4:** defines that 55.7% the studied nurses had satisfactory intravenous therapy skill. Whereas nurses' practice regarding Infusion process of thrombolytic therapy; 21.4% of the nurses studied had appropriate practice at pre infusion phase, while 30.0% of studied nurses had satisfactory practice in intra infusion phase and 44.3% at post infusion phase. Regarding to total infusion practice of thrombolytic therapy, the current finding clarified that only 18.6% of studied nurses had a satisfied total practice of thrombolytic therapy.

**Table 5:** shows that the most common factors were affected the nurses' performance were the factors related to work, which clarified that 97.1% of the studied nurses affected by the environment of work, 94.3% of studied nurses affected by relationship with doctors, 88.6% of studied nurses affected by the organization of work

and 87.1% of studied nurses affected by appreciation from others and the same percent of studied nurses affected by relationship with colleagues from the nursing staff. Regarding to the factors related to nurses that affected their performance the same table illustrates that 87.1%, 82.9%, 75.7% and 74.3% (respectively) of studied nurses were affected by physical health status, occupational status, social and economic status and psychological health status.

**Figure 1:** Total factors affecting nurses' performance regarding thrombolytic therapy among patients with AMI. Figure 1 demonstrates that 91.40% of nurses studied had factors affected their performance with mean± SD 64.6±9.3 and range from 39-77.

**Table 6:** reveals the link between nurses' understanding of thrombolytic therapy and their total practice. The table indicated a statistically significant relationship between nurses' knowledge at definition of thrombolytic therapy, precautions and diagnostic test for administration of thrombolytic therapy with P.value 0.01, 0.01& 0.008 respectively.

**Table 7:** explores the connection between nurses' overall practice regarding thrombolytic therapy and their total knowledge among patients having acute myocardial infarction. The table revealed a statistically significant relation between nurses' total practice at post infusion phase, infusion of thrombolytic therapy and total satisfactory practice with P.value was 0.049, 0.026& 0.006 respectively.

**Table 8:** explores the relation between nurses' total knowledge regarding thrombolytic therapy among patients with acute MI and factors affecting nurses' performance. The

table demonstrated a statistically significant linkage between nurses' overall knowledge in regard to thrombolytic therapy among patients with acute MI and the factors affecting their performance at appreciation from others with P.value was 0.018.

**Table 9:** illustrated the relation between nurses' total practice regarding thrombolytic therapy among patients with acute MI and the factors affecting nurses' performance. This table indicated there is not any statistically significant link between nurses' overall practice and the factors affecting their performance with p.value was >0.05.

**Table 10:** shows the correlation between nurses' overall knowledge scores, practice scores, factors affecting nurses' performance and their demographic characteristics. The table indicated a statistically significant correlation between nurses' total knowledge and overall practice at P value 0.004.

### Discussion:

In terms of demographic features of the investigated nurses, the current study found that the majority of the examined nurses were between the ages of 20 and 50. These findings agree with Tsaloukidis et al.,<sup>(17)</sup> who reported in research about "Evaluating Emergency Department Nurses' Knowledge in Recognizing and Treating Emergency Cardiovascular Events," at Attikon University Hospital, Athens" that the average nurses' age was 34.1 years with range (21-50) years.

Also this study finding was bolstered by Yones et al<sup>(18)</sup> who found in study at port said hospitals about " assessment of nurses' performance

regarding caring of patients on anticoagulation therapy" that the age of nurses' was ranged from 20- 50 years.

While this result is in disagreement with Qadir & Younis<sup>(19)</sup> who stated in a study about the nursing service quality for patients experiencing acute MI in Erbil city hospitals' coronary departments, that the age of nurses' was ranged from (22-28) years.

Our results explicated that the majority of investigated nurses were women and married. These data are consistent with Manzari et al<sup>(20)</sup> who reported in a study about examining nurses' knowledge and skills in the diagnostic and therapeutic use of Lead aVR, that most of the nurses studied were females. Also this result is in agreement with Azhigul et al.<sup>(21)</sup> who found in study about "Kazakhstani nurses' knowledge of pain assessment and management in intensive care units" that most of the investigated nurses were females and married.

This study finding contradicted with Jaralnabi et al<sup>(22)</sup> who reported in a research about the The Impact of a Nursing Education Program on Nurses' Knowledge, Attitudes, and Intentions Towards MI Prevention and Treatment at King Abdul-Aziz University in Jaddah , that the majority of studied nurses were males. The high ratio of female to male nurses was still reported in many studies since the admission of male students in nursing school only dated less than two decades so that the nursing workforce was still more feminine.

Regarded nurses' qualification the study result revealed that less than half of studied nurses had diploma degree in nursing sciences. This finding might be related to decrease number of high graduated nurses attached and working at Zagazig University Hospital. This

finding is harmony with Shuaib<sup>(23)</sup> who stated in a study about nurses knowledge concerning management of pain in cases in Critical Care Units, that over two third of the surveyed nurses seemed to have a diploma in nursing sciences.

The present study is not correspondent with Gazestani et al<sup>(24)</sup> who found in study at Kerman Seyed Al Shohada Hospital, about nurses' performance, accountability, and confidence in providing sexual counselling to MI patients, that the majority of studied nurses seemed to have a bachelor in nursing science. Also, these data contradicted with Tahboub & Yilmaz<sup>(25)</sup> who mentioned in study about "Nurses' Knowledge and Practices of Electrocardiogram Interpretation" that the greater number of surveyed nurses seemed to have bachelor in nursing science.

The current research revealed that less than two third of the investigated nurses had over 5 years experience in ICCU. This is compatible with Khalifehzadeh et al.<sup>(26)</sup>, who noticed in a research entitled "The impact of Synergy Model on nurses' performance and the satisfaction of patients with ACS", that the most of the studied nurses seemed to have a job experience up to 5 years in CCU. This is contraindicated with Baez et al<sup>(27)</sup> in their study about the Evaluation of Cardiac Care Unit Nurses' Knowledge of Chest Pain Management and Respiratory Care, as recorded that less than 50 % of the studied nurses seemed to have 1-5 years' experience in Cardiac Care Unit.

Also this study finding was supported by Verma & Adhikary<sup>(28)</sup> who found in a study conducted at J.K. Hospital in Bhopal to examine staff

nurses' knowledge of the first 24 hours of care for patients with MI in order to build a self-education module, that the half of the studied nurses had 1-2 year' experience in cardiac care unit.

The current study finding reported that most of the surveyed nurses hadn't attended any training classes of caring of patients suffering from MI and thrombolytic therapy before. This might explain the deficiencies in their knowledge and practice and this might be due to inadequacy of trainers that able to give training to nursing staff and might be due to unavailability of training chance.

These study finding is in agreement with Mustafa & Elfaki<sup>(29)</sup> who reported in study about the investigation of nurses' understanding of preliminary medications used during emergency therapy of acute MI at Al Qura University in Khartoum, Sudan', that most of nurses studied hadn't receive previous training sessions. Also, Sedighie et al.<sup>(30)</sup> in their study about the Impact of a thorough training session in management of pain on ICU Nurses' Awareness and Attitudes at Tehran Modarres Hospital, mentioned that most surveyed nurses hadn't receive training classes before intervention. This contradicted with Al Ftlawy<sup>(31)</sup> who reported in his master thesis about the Assessment of Nurses' Awareness Toward Care Provided to Patients having Acute MI at Al-Najaf City, Kufa University", that the most of studied nurses had training courses.

In regard to nurses knowledge about acute MI our research had clarified that the lowest percentage of the surveyed nurses had satisfactory knowledge about acute myocardial infarction. This is in accordance with Ravindra et al.<sup>(32)</sup> who



reported in their study about examining the usability of ACS Algorithm on Nursing Management of Patient suffering from ACS in Staff Nurses of Selected Hospital Waghodia, that the majority of investigated nurses had inadequate level of knowledge about ACS. Also, Lakshmi<sup>(33)</sup> in his study about evaluating the Level of Knowledge concerning the assessment and management of MI in Nurses' Staff in certain Hospital at Mysore, who found that lack of accurate knowledge about acute MI among nurses.

This study result is contraindicated with Hamdan & Al Momani<sup>(34)</sup> who reported in their thesis about patients' opinions on education requirements of the Jordanian nurses and acute myocardial infarction at Al Balqa Applied University", that most nurses had satisfactory awareness about acute MI. Also this finding was supported by Al Hassan & Mohammed<sup>(35)</sup> who found in a study entitled " Nurse's performance regarding immediate management of patients with acute MI at Khartoum state" that most nurses seemed to have satisfactory understanding concerning management of Acute MI.

In accordance with nurses' knowledge regarding thrombolytic therapy the current research demonstrated that, only lowest percentage of investigated nurses seemed to have adequate knowledge concerning thrombolytic therapy. This go in line with Mahany et al<sup>(36)</sup> who reported in study about the Investigation of a Post-MI Medication Education Program for Nurses in Coronary Care Units at Minia University Hospital and El-Amiry Hospital, that most nurses had insufficient degree of knowledge about post MI medications.

But this study results disagreed

with Al Sayed et al<sup>(37)</sup> who noticed in the study about factors affecting Nurses' Performance for Patients with Acute MI within the Golden Hours" at National Heart Institute Hospitals, that less than 50 % of the nurses studied seemed to have adequate degree of understanding regarding management of AMI within golden hours.

Our research illustrated that just lowest percentage of surveyed nurses had a satisfied overall practice of thrombolytic therapy. This result is harmony with Eweas<sup>(38)</sup> who reported in study about the coronary care nurses' knowledge and practice concerning of thrombolytic therapy in patients with acute MI at cairo University" that the majority of nurses had unsatisfactory level of practice regarding thrombolytic therapy. Also these data goes consistent with Salahshoori et al<sup>(39)</sup> who reported in study entitled " The Knowledge, Attitude, and Practice of Women Health Services Staff About Risk Factors of Cardiovascular Diseases at City of Fereydan and Chadegan, Iran" that the majority of nurses seemed to have inadequate degree of practice concerning thrombolytic therapy.

But this study results are not correspondent with Al Sayed et al<sup>(40)</sup>, that over two thirds of the nurses studied seemed to have a proper degree of practice concerning management of AMI in golden hours.

Our results displayed that the majority of the performance of the investigated nurses in thrombolytic therapy administration was influenced by nurses, patients and work-linked elements affecting nurses' performance. These data is in agreement with Gouda et al<sup>(41)</sup> in a study entitled " Factors Affecting Postoperative Nursing Performance in The Surgical Units" at

Benha University Hospitals, who mentioned that performance of most investigated nurses was influenced by the previous mentioned elements.

Also Said et al <sup>(42)</sup> in their study entitled " Factors Affecting Nurses' Performance toward Central Line Associated Blood Stream Infection in Critical Care Units" at Ain Shams University Hospitals, who stated that most surveyed nurses reported that factors had affected their performance. Similar finding was mentioned by Saleem & Sayej <sup>(43)</sup> in the study entitled " Selected Organizational Factors Affecting Performance of Professional Nurses in North West Bank Governmental Hospitals" at Al Quds university, Palestine, who indicated that about three quarter of studied nurses reported that organization factors had affected their performance.

Additionally Mohamed et al <sup>(44)</sup> in a study entitled" Nurses Performance Regarding Orthopedic Patients with External Fixation at Zagazig University Hospitals" who represented that most surveyed nurses were influenced by environmental variables, while only 14.5 % of the studied nurses were affected by occupational factors.

Our findings were in disagreement with Al Ftlawy <sup>(45)</sup>, who assumed that there was significant link between demographic features of nurses and their knowledge concerning thrombolytic therapy among patients with AMI. In addition to this Mahany et al <sup>(46)</sup> who represented that, there was significant relationship between nurses' knowledge and their demographic characteristics.

### Conclusion

Overall nurses knowledge concerning thrombolytic therapy

among patients with AMI; About one quarter of the studied nurses seemed to have satisfactory degree of knowledge and about one fifth of the studied nurses had adequate level of practice. There were several factors affecting nurses' performance as factors related to nurses. Most of the investigated nurses was affected by physical health status. About three quarter of the studied nurses was affected by psychological health status and social and economic status. The majority of the studied nurses was influenced by variables connected to patient and elements related to work. The most of the studied nurses was affected by factors related to the work environment. The total factors was affecting nurses' performance regarding thrombolytic therapy among patients having AMI.

### Recommendation

- Training programs are highly recommended to improve nurses knowledge and practice regarding caring of patients with acute myocardial infarction on thrombolytic therapy
- Training program for nurses working with myocardial infarction patients to upgrade their physical, psychological, social well-being.
- The studied factors affecting nurses' performance should be addressed by the nursing management and hospital administration.
- Further research is suggested to assess the value of specialized training program or interventions on nurses' performance regarding caring of patients with acute myocardial infarction on thrombolytic therapy and factors

affecting nurses' performance.

**Table 1:** Frequency and Percentage Distribution of Demographic Features of Surveyed Nurses (n=70)

<b>Demographic characteristics</b>	<b>No</b>	<b>%</b>
<b>Age:</b>		
<30 Years	34	48.6
≥30 Years	36	51.4
Mean ±SD Range	30.8±7.9 20-50	
<b>Gender:</b>		
Male	12	17.1
Female	58	82.9
<b>Marital status:</b>		
Single	59	84.3
Married	11	15.7
<b>Nursing qualification:</b>		
Bachelors	16	22.9
Technical institute	26	37.1
Diploma	28	40.0
<b>Nurses' total experience years:</b>		
<5 Years	22	31.4
≥5 Years	48	68.6
Mean ±SD Range	11.7±8.3 >1-32 years	
<b>Nurses' experience years in ICU</b>		
<5 Years	27	38.6
≥5 Years	34	48.6
Mean ±SD Range	10.1±8.2 >1-26 years	
<b>Attendance of Training courses</b>		
Yes	24	34.3
No	46	65.7

**Table 2:** Frequency of Studied Nurses' Knowledge Concerning Patients with Acute Myocardial Infarction (n=70):

Nurses' knowledge regarding AMI	Satisfactory ≥70%		Unsatisfactory <70%	
	No	%	No	%
Definition of AMI	42	60.0	28	40.0
Causes of AMI	58	82.9	12	17.1
Signs and Symptoms	4	5.7	66	94.3
Types of AMI	3	4.3	67	95.7
Risk Factors	57	81.4	13	18.6
Diagnosis	26	37.1	44	62.9
Complications	13	18.6	57	81.4
Treatment of Myocardial infarction	12	17.1	58	82.9
Managment of Myocardial complications	12	17.1	58	82.9
Total knowledge about AMI	5	7.1	65	92.9

**Table 3:** frequency of Studied Nurses' Knowledge Concerning Thrombolytic Therapy (n=70)

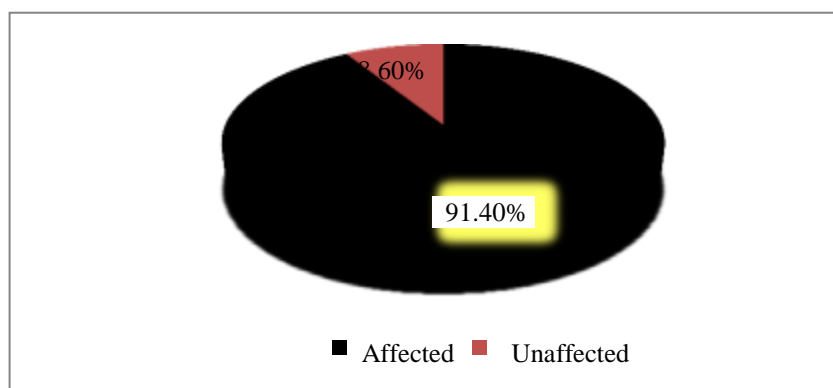
Nurses' Knowledge Regarding Thrombolytic Therapy	Satisfactory		Unsatisfactory	
	No	%	No	%
Definition of thrombolytic therapy	5	7.1	65	92.9
Types of thrombolytic therapy	15	21.4	55	78.6
Mechanism of action	26	37.1	44	62.9
Contraindications of thrombolytic therapy	34	48.6	36	51.4
Side effects	36	51.4	34	48.6
Preparation for administration	12	17.1	58	82.9
Precautions	19	27.1	51	72.9
Route of administration	47	67.1	23	32.9
Onset of action	31	44.3	39	55.7
Antidote for thrombolytic therapy	23	32.9	47	67.1
Indications of thrombolytic therapy	49	70.0	21	30.0
Diagnostic tests	18	25.7	52	74.3
Complications of thrombolytic therapy	24	34.3	46	65.7
Total Knowledge about Thrombolytic Therapy	12	17.1	58	82.9

**Table 4:** Frequency of Studied Nurses' Practice Concerning Infusion of Thrombolytic Therapy for Patients having Acute Myocardial Infarction (n=70):

Nurses' practices Regarding Infusion of Thrombolytic Therapy	Satisfactory		Unsatisfactory	
	No	≥70%	No	<70%
Intravenous therapy practice	39	55.731		44.3
Infusion process of Thrombolytic Therapy				
Pre infusion phase	15	21.455		78.6
Intra infusion phase	21	30.049		70.0
Post infusion phase	31	44.339		55.7
Total nurses' practice of Thrombolytic Therapy	13	18.657		81.4

**Table 5:** Factors Affecting Nurses' Performance Regarding Thrombolytic Therapy among Patients suffering from AMI(n=70):

Factors Affecting Nurses' Performance	Affected ≥60%		Not Affected <60%	
	No	%	No	%
Factors related to nurses:				
Nurses' physical health status	61	87.1	9	12.9
Nurses' psychological health status	52	74.3	18	25.7
Nurses' social and economic status	53	75.7	17	24.3
Nurses' occupational status	58	82.9	12	17.1
Factors related to patients	55	78.6	15	21.4
Factors related to work:				
Relationship with colleagues from the nursing staff	61	87.1	9	12.9
Relationship with doctors	66	94.3	4	5.7
Appreciation from others (Incentive)	61	87.1	9	12.9
Factors related to the organization of work	62	88.6	8	11.4
Factors related to the work environment	68	97.1	2	2.9



**Total factors affecting nurses' performance**

**Figure 1:** Total factors influencing nurses' performance concerning thrombolytic therapy of patients with acute myocardial infarction (n=70)

**Table 6:** Relation between Nurses' Knowledge and their Total Practice Concerning Thrombolytic Therapy (n=70):

Knowledge Regarding Thrombolytic Therapy	Total practice				$\chi^2$	p-value
	Satisfactory $\geq 70\%$		Unsatisfactory $< 70\%$			
	No	%	No	%		
Definition of thrombolytic therapy						
Satisfactory	4	23.53	1	1.89	F	0.01*
Unsatisfactory	13	76.47	52	98.11		
Types of thrombolytic therapy						
Satisfactory	6	35.29	9	16.98	F	0.17
Unsatisfactory	11	64.71	44	83.02		
Mechanism of action thrombolytic						
Satisfactory	9	52.94	17	32.08	2.4	0.12
Unsatisfactory	8	47.06	36	67.92		
Contraindications of thrombolytic Therapy						
Satisfactory	11	64.71	23	43.40	2.3	0.13
Unsatisfactory	6	35.29	30	56.60		
Side effects						
Satisfactory	9	52.94	27	50.94	0.02	0.88
Unsatisfactory	8	47.06	26	49.06		
Preparation for administration						
Satisfactory	6	35.29	6	11.32	F	0.06
Unsatisfactory	11	64.71	47	88.68	F	0.06
Precautions						
Satisfactory	9	52.94	10	18.87	F	0.01*
Unsatisfactory	8	47.06	43	81.13		
Route of administration.						
Satisfactory	11	64.71	36	67.92	0.06	0.81
Unsatisfactory	6	35.29	17	32.08		
Onset of action						
Satisfactory	9	52.94	22	41.51	0.68	0.41
Unsatisfactory	8	47.06	31	58.49		
Antidote for thrombolytic therapy						
Satisfactory	6	35.29	17	32.08	0.06	0.81
Unsatisfactory	11	64.71	36	67.92		
Indications						
Satisfactory	13	76.47	36	67.92	0.45	0.5
Unsatisfactory	4	23.53	17	32.08		
Diagnostic test						
Satisfactory	9	52.94	9	16.98	F	0.008*
Unsatisfactory	8	47.06	44	83.02		
Complications						
Satisfactory	6	35.29	18	33.96	0.01	0.92
Unsatisfactory	11	64.71	35	66.04		
Total knowledge about Thrombolytic						
Satisfactory	6	35.29	6	11.32	F	0.06
Unsatisfactory	11	64.71	47	88.68		

**Table 7:** Relation between Nurses' Total Practice Regarding Thrombolytic Therapy among Patients with AMI and Their Total Knowledge (n=70):

Total Practice	Total Knowledge				$\chi^2$	p-value
	Satisfactory $\geq 70\%$		Unsatisfactory $< 70\%$			
	No	%	No	%		
Intravenous skill therapy						
Satisfactory	8	53.33	31	56.36	0.04	0.83
Unsatisfactory	7	46.67	24	43.64		
Pre infusion phase						
Satisfactory	4	26.67	11	20.00	F	0.73
Unsatisfactory	11	73.33	44	80.00		
Intra infusion step						
Satisfactory	5	33.33	16	29.09	F	0.76
Unsatisfactory	10	66.67	39	70.91		
post infusion step						
Satisfactory	10	66.67	21	38.18	3.87	0.049*
Unsatisfactory	5	33.33	34	61.82		
Infusion of thrombolytic therapy						
Satisfactory	6	40.00	7	12.73	F	0.026*
Unsatisfactory	9	60.00	48	87.27		
Total satisfactory practice						
Satisfactory	8	53.33	9	16.36	F	0.006*
Unsatisfactory	7	46.67	46	83.64		

**Table 8:** Relation between Nurses' Total Knowledge Regarding Thrombolytic Therapy among Patients with AMI and Factors Affecting Nurses' Performance (n=70):

Factors Affecting Nurses' Performance	Total Knowledge				$\chi^2$	p-value
	Satisfactory $\geq 70\%$		Unsatisfactory $< 70\%$			
	No	%	No	%		
<b>Factors related to nurses' physical health status</b>						
Affected	15	100.00	46	83.64	61	0.19
Unaffected	0	.00	9	16.36	9	
<b>Nurses' psychological health status</b>						
Affected	14	93.33	38	69.09	52	0.093
Unaffected	1	6.67	17	30.91	18	
<b>Nurses' social and economic status</b>						
Affected	12	80.00	41	74.55	53	0.99
Unaffected	3	20.00	14	25.45	17	
<b>Occupational status</b>						
Affected	13	86.67	45	81.82	58	0.99
Unaffected	2	13.33	10	18.18	12	
<b>Factors related to Patients</b>						
Affected	9	60.00	46	83.64	55	0.073
Unaffected	6	40.00	9	16.36	15	
<b>Factors related to work Relationship with colleagues from the nursing staff</b>						
Affected	12	80.00	49	89.09	61	0.39
Unaffected	3	20.00	6	10.91	9	
<b>Relationship with doctors</b>						
Affected	14	93.33	52	94.55	66	0.99
Unaffected	1	6.67	3	5.45	4	
<b>Appreciation from others (Incentive)</b>						
Affected	10	66.67	51	92.73	61	0.018*
Unaffected	5	33.33	4	7.27	9	
<b>Factors related to the organization of work</b>						
Affected	13	86.67	49	89.09	62	0.99
Unaffected	2	13.33	6	10.91	8	
<b>Factors related to the work environment</b>						
Affected	15	100.00	53	96.36	68	0.99
Unaffected	0	.00	2	3.64	2	
<b>Total Factors</b>						
Affected	13	86.67	51	92.73	64	0.602
Unaffected	2	13.33	4	7.27	6	



**Table 9:** Relation between Nurses' Total Practice Regarding Thrombolytic Therapy among Patients with AMI and Factors Affecting Nurses' Performance (n=70):

Factors Affecting Nurses' Performance	Total Practice				χ <sup>2</sup>	p-value
	Satisfactory ≥70%		Unsatisfactory <70%			
	No	%	No	%		
<b>Factors related to nurses</b>						
Nurses' physical health status						0.1
Affected	17	100.00	44	83.02	61	
Unaffected	0	.00	9	16.98	9	
<b>Nurses' psychological health status</b>						
Affected	12	70.59	40	75.47	52	0.75
Unaffected	5	29.41	13	24.53	18	
<b>Nurses' social and economic status</b>						
Affected	13	76.47	40	75.47	53	0.99
Unaffected	4	23.53	13	24.53	17	
<b>Occupational status</b>						
Affected	13	76.47	45	84.91	58	0.46
Unaffected	4	23.53	8	15.09	12	
<b>Factors related to patients</b>						
Affected	12	70.59	43	81.13	55	0.49
Unaffected	5	29.41	10	18.87	15	
<b>Factors related to work</b>						
<b>Relationship with colleagues from the nursing staff</b>						
Affected	16	94.12	45	84.91	61	0.44
Unaffected	1	5.88	8	15.09	9	
<b>Relationship with doctors</b>						
Affected	17	100.00	49	92.45	66	0.57
Unaffected	0	.00	4	7.55	4	
<b>Appreciation from others (Incentive)</b>						
Affected	14	82.35	47	88.68	61	0.68
Unaffected	3	17.65	6	11.32	9	
<b>Factors related to the organization of work</b>						
Affected	15	88.24	47	88.68	62	0.99
Unaffected	2	11.76	6	11.32	8	
<b>Factors related to the work environment</b>						
Affected	16	94.12	52	98.11	68	0.43
Unaffected	1	5.88	1	1.89	2	
<b>Total factors</b>						
Affected	16	94.12	48	90.57	64	0.99
Unaffected	1	5.88	5	9.43	6	

χ<sup>2</sup> =Chi square test f=Fisher exact test P.value >0.05

**Table 12:** Correlation between Nurses' Knowledge Scores, Practice Scores, Factors Affecting Nurses' Performance and their Demographic aspects.

Items	Knowledge	
	(r)	P
practice scores	0.343	0.004*
Factors affecting nurses' Performance	0.063	0.605
Age	0.082	0.501
Nurses' total experience years	0.108	0.375
Nurses' experience years in ICCU	0.074	0.542

(r) correlation coefficient

significant p<0.05

**References**

1- Ceschi A., Demerouti E., Sartori R., and Weller J. Decision-Making Processes in the Work Place: How Exhaustion, Lack of Resources and Job Demands Impair Them and Affect Performance , *Front Psychol.* (2017); 8, 313. doi: 10. 3389/ fpsyg.2017.00313.

2- Gunawan N P L N., Hariyati T S., Gayatri D. Motivation as a Factor Affecting Nurse Performance in Regional General Hospitals: A factors analysis, *Enfermeria Clinica*, July, (2019) 29(2), 515-520.

3- Vasques P C., Gonzalez G R., Feraud E H., Cabrera D D., Klijn T P., and Moreno M B. Psychological Factors and Mental Work Load: a reality perceived by nurses in intensive care units, *Rev Lat Am Enfermagem*, (2015); 23(2), 315-322.

4- Al-Sagarat A., Qan'ir Y., Al-Azzam M., Obeidat H. and Khalifeh A. Assessing the Impact of Workplace Bullying on Nursing Competences among Registered Nurses in Jordanian Public Hospitals, *Nursing Forum J*, (2018); 53(3), 304–313.

5- Ismaiel M H., Reizian A E. and Hamouoda G M. Factors Affective Nurses' Career Development, *Journal of American Science*, (2013); 9(5), 163–172.

6- Wu X., Li J., Liu G., Liu Y., Cao J. and Jia Z. The Effects of Emotional Labor and Competency on Job Satisfaction in Nurses of China: A Nationwide Cross-Sectional Survey, *International Journal of Nursing Sciences*, (2018); 5(4), 383–389.

7- Tesfaye T., Abera A., Balcha F., Nemera G., and Belina S.: Assessment of Factors Affecting Performance of Nurses Working at Jimma University Specialized Hospital in Jimma Town, Oromia Region, South-West Ethiopia, *Journal of Nursing & Care*, Dec, (2015); 4(6), 1-7.

8- World health organization, (2018): epidemiology of acute coronary syndrome, available at oxford medicine. com>med- 9 7 8 0 1 9 8 7 8 4906, accessed on, 10 Oct, 2020, at 6.00pm.

9- Adawi A., Zadegan N., Fadhila A., & Sadegh M. :Cardiovascular diseases in the Eastern Mediterranean Region: epidemiology and risk factor burden, *Nature Review Cardiology* , September, (2017); 15(1), 106-119.

10- Chai L., Putit Z., & Siop S. :Barrier to Timely Treatment Seeking Patients with Acute Myocardial Infarction, *DMC Nursing*, (2016); 10(1), 1-2.

11- Awases M H., Bezuidenhout M C., Roos J H. Factors Affecting The Performance of Professional Nurses in Namibia, *Curationis*, (2013); 36(1), 1-8

12- Lewis S., Bucher L., Margaret M., Heitkemper., Mariann M., Harding., Kwong J. and Roberts D. :Medical Surgical Nursing: Assessment and Management of Clinical Problems, Problem of Oxygenation and Perfusion, 10<sup>th</sup> ed, Elsevier Health Sciences, USA, (2016) P:722- 727.

13- Ali, R., Hossain, S, M., Islam, A., Arman, I, S., Raju, S,G., Dasgupa, p., Noshin, f, T. :Aspect of Thrombolytic Therapy, *The Scientific World Journals*, Dec, (2014); 1(1), 4.

14- World health organization,(2019): IV insertion checklist, available at www.wallacestate.edu> files> IV

- insertion checklist-BB posted, accessed on, 12 Dec, 2019, at 2.00 pm.
- 15- Gouda A H., Mohammed E T. and Ameen D A., (2019): Factors Affecting Postoperative Nursing Performance in The Surgical Units, *Egyptain Journal of Health Care*, Dec; 10(1), 54-56.
  - 16- Ullah T., Ullah R., Khan A., Khan J Z. and Jan S S., (2018): Factors Affecting the Performance of Clinical Nurses; 5(3), 125-137.
  - 17- Tsaloukidis R., Trifoni M., Peponi Ch., Marraki F., Gozadinos. and Lazakidou., :Evaluating Knowledge of Emergency Department Nurses in Recognition and Treatment of Emergency Cardiovascular Events, *International Journal of Health Research and Innovation*, January; (2015), 3(1), 19- 21.
  - 18- Yones F E A., Qalawa S A A., Abo Elata A B. and Ahmed H M., :Assessment of Nurses' Performance Regarding Caring of Patients on Anticoagulation Therapy in Port Said Hospitals, *Port Said Scientific Journals of Nursing*; (2019), 6(3), 6-9.
  - 19- Qadir D O. & Younis Y M., :Quality of Nursing Care for Patients with Acute Myocardial Infarction at Coronary Units of Erbil City Hospitals, *Zanco J.Med.Sci*, Sep; (2015), 19(2), 1012-1013.
  - 20- Manzari Z., Bazzi A. and Sharafi S., Investigating Nurses' Knowledge and Performance on the Diagnostic and Therapeutic Application of Lead aVR, *Medical Surgical Nursing Journal*; (2018), 7(4), 2.
  - 21- 17-Azhigul A., Johanna H. and Dinara O., :Kazakhstan Nurses' Knowledge of Pain Assessment and Management in Intensive Care Unit, *Social Service, Health and Sports*, Aug; (2020), 43, 23.
  - 22- Jaralnabi A A., Atawi S., Sagiron W I., Alasmari N. and Alasmari H.,:Effect of Education Program on Nurses' Knowledge, Attitudes, and Intentions Towards Myocardial Infarction Prevention and Treatment, *American Journal of Environment and Occupational Health*, Aug; (2017), 2(2), 7-14.
  - 23- Shuaib N., :Nurses Knowledge Regarding Pain Management among Patients in Critical Care Units, *JCAO*, an open access Journal, Aug; (2018), 2(2), 2-4.
  - 24- Gazestani T., Shahrbabaki P M., Rabori R M. and Forouzi M A.,:Sexual Counseling to Patients with Myocardial Infarction: Nurses' Performance, Responsibility and Confidence, *Nursing Public Today*, Oct; (2019), 6(4), 216-219.
  - 25- Tahboub O Y H. and Yilmaz U D.,:Nurses' Knowledge and Practices of Electrocardiogram Interpretation, *International Cardiovascular Research Journal*, Jul; (2019),13(3), 81.
  - 26- Khalifehzadeh A., Jahromi M K. and Yazdannik A., :The impact of Synergy Model on Nurses' Performance and The Satisfaction of Patients with Acute Coronary Syndrome, *Iranian Journal of Nursing and Midwifery Research*, Feb; (2012),17(1), 18.
  - 27- Baez Y K., Shakor S Q. and Ali S M.,: Assessment of Nurses Staff Knowledge Regarding Chest Pain Management and Respiratory Maintains in Cardiac Care Unit, *Indian Journal of Public Health Research*, October; (2019), 10 (10), 1267- 1268.
  - 28- Verma D K. and Adhikary J., :A Study to Assess the Knowledge of Staff Nurses Regarding First 24 Hours Care of Patients with Myocardial Infarction at J.K. Hospital of Bhopal with a View to Develop Self Instruction Module, *IOSR Journal of Nursing and Health Science*, June; (2019), 8(3), 31.
  - 29- Mustafa H E M. and El faki B A M.,:Determination Nurses' Knowledge about Initial Drugs used During Emergency Management of Acute Myocardial Infarction, *Journal of Nursing Education and Practice*, Dec; (2017), 7(5), 64-66.
  - 30- Sedighie L., Bolourchifard F., Rassouli M. and Zayeri, F., :Effect of Comprehensive Pain Management Training Program on Awareness and Attitude of ICU Nurses, *Anesthesiology and Pain Medicine*, March; (2020), 10(2), 6.
  - 31- El Ftawy D M H.,: Determination of Nurses' Knowledge toward Care

- Provided to Patients with Acute Myocardial Infarction in Al Najaf City. Published master thesis. Faculty of Nursing. Kufa University,(2011).
- 32- Ravindra H N., Prajapat M. and Balagavi D., :A Study to Assess the Effectiveness of Acute Coronary Syndrome Algorithm on Nursing Management of Patient with Acute Coronary Syndrome among Staff Nurse of Selected Hospital Waghodia, International Journal of Nursing Education, March; (2020), 12(1), 53.
- 33- Lakshmi K N, :A Study to Assess the Level of Knowledge Regarding Assessment and Management of Myocardial Infarction among Nursing Staff in Selected Hospital at Mysore, JOJ Nurse Health Care, August; (2018), 8(5), 2.
- 34- Hamdan F R S. and Al Momani I N.,: Jordanian Nurses and Acute Myocardial Infarction Patients' Perceptions about Learning Needs, Global Science Research Journals, May; (2015), 3(3), 85-99.
- 35- Al Hassan. and Mohammed S O.,:Nurse's Performance Regarding Immediate Management of Patients with Acute Myocardial Infarction in Khartoum State. Published master thesis. Faculty of nursing. Shendi University, (2018).
- 36- Mahany A D., Taha N M., El Shafay O A. and Gamal El Dein G A., :Evaluation of a Teaching Program about post Myocardial Infarction Medications for Nurses of Coronary Care Units, Faculty of nursing, Minia University, Published thesis, Assuit Scientific Nursing Journal, Doctorate degree in medical- surgical nursing, Dec, (2013), 1(2), 21-23.
- 37- El Sayed S M., El Senousy T A. and Ameen D A., :Factors Affecting Nurses' Performance for Patients with Acute Myocardial Infarction within Golden Hours. Published master thesis. Faculty of nursing. Ain Shams University, (2017).
- 38- Eweas A S., Khalil N S. and Ismaeel M S., :Thrombolytic Therapy in Acute in MI: Coronary Care Nurses' Knowledge and Practice, British Journal of Cardiac Nursing, Aug; (2018), 13(8), 376.
- 39- Salahshoori A., Nasirzadeh M., Haruni J., Pourhaji F., Salahshoori S. and Nazarpour J., :The Knowledge, Attitude, and Practice (KAP) of Women Health Services Staff About Risk Factors of Cardiovascular Diseases (CVDs) in City of Fereydan and Chadegan, Iran, Jundish apur J Chronic Dis Care, January; (2015), 4(1), 2-3.
- 40- El Sayed S M., El Senousy T A. and Ameen D A., :Factors Affecting Nurses' Performance for Patients with Acute Myocardial Infarction within Golden Hours. Published master thesis. Faculty of nursing. Ain Shams University, (2017).
- 41- Gouda A H., Mohammed E T. and Ameen D A., :Factors Affecting Postoperative Nursing Performance in The Surgical Units, Egyptain Journal of Health Care, Dec; (2019), 10(1), 54-56.
- 42- Said N Y., Yassien S. and Ameen D A.,: Factors Affecting Nurses' Performance toward Central Line Associated Blood Stream Infection in Critical Care Units, Egyptain Journal of Health Care; (2020), 11(1), 239-243.
- 43- Saleem A. and Sayej S., :Selected Organizational Factors Affecting Performance of Professional Nurses in North West Bank Governmental Hospitals, Journals of Education and Practice; (2015), 6(7),104-108.
- 44- Mohamed N M M., Taha N M. and Moghazy N A., Nurses Performance Regarding Orthopedic Patients with External Fixation at Zagazig University Hospitals, Egyptian Journal of Health Care; (2020), 11(1), 122.
- 45- El Ftawy D M H., :Determination of Nurses' Knowledge toward Care Provided to Patients with Acute Myocardial Infarction in Al Najaf City. Published master thesis. Faculty of Nursing. Kufa University,(2011).
- 46- Mahany A D., Taha N M., El Shafay O A. and Gamal El Dein G A.,:Evaluation of a Teaching Program about post Myocardial Infarction Medications for Nurses of Coronary Care Units, Faculty of nursing, Minia University, Published thesis, Assuit Scientific Nursing Journal, Doctorate degree in medical- surgical nursing, Dec, (2013), 1(2), 21-23.

