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Effectiveness of Pain Management Educational Program on Nurse's knowledge toward Chest Pain Management for Patients with Acute Myocardial Infarction

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الخلاصة:

خلفية البحث: تدابير الألم تعد شرطا مقنعا وعالميا في مجال الرعاية التمريضية, بالرغم من التقدم الكبير لاتزال الاثار الفسيولوجية والنفسية الضارة للألم غير المعالج بدون حل كبير خصيصا لمرضى احتشاء عضلة القلب الحاد. ولها تأثير على المرضى من خلال إطالة فترات بقائهم في المستشفى وتأخير عملية الشفاء.

الاهداف: تهدف هذه الدراسة الى تقييم معارف الممرضين ومدى فاعلية البرنامج التعليمي حول تدابير ألم الصدر لمرضى احتشاء عضلة القلب الحاد.

منهجية البحث: تم استخدام تصميم قبل التجريبي (مجموعة واحدة، لاختبار القبلي، والاختبار البعدي) لإجراء هذه الدراسة في وحدة الرعاية القلبية التاجية بمستشفى الديوانية التعليمي للفترة من (15تشرين الثاني 2021، إلى 28 نيسان 2022). تم استخدام عينة غير احتمالية (هادفة) لاختبار (30 ممرض/ة) يعملون في وحدة الرعاية القلبية التاجية.

النتائج: اظهرت نتائج الدراسة عن وجود فروق ذات دلالة إحصائية عالية بين درجات معارف الملاك التمريضي في مستويين من القياسات (الاختبار القبلي والبعدي) بقيمة احتمالية (0.000)، حيث ان المتوسط الإحصائي لدرجات المعارف الكلية للملاك التمريضي في الاختبار القبلي كان منخفضا (1.5) وبعد تطبيق البرنامج التعليمي اظهرت النتائج وجود فروق ذات دلالة احصائية عالية لمعارف الممرضين في الاختبار البعدي.

الاستنتاج: لخصت الدراسة الى ان للبرنامج التعليمي أثر إيجابي على معارف الممرضين المتعلقة بتدابير الم الصدر لمرضى احتشاء عضلة القلب الحاد.

التوصيات: أوصت الدراسة بضرورة تفعيل عمل وحدة التعليم التمريضي المستمر بشكل صحيح من أجل إعطاء دورات تدريبية للممرضين العاملين في وحدة الرعاية القلبية التاجية المتعلقة بتدابير الم الصدر باستخدام الطرق الدوائية وغير الدوائية لمرضى احتشاء عضلة القلب الحاد، بالإضافة إلى إنشاء بروتوكول مكتوب ومحدث حول تدابير الألم لتأكيد كفاية المعارف والممارسات التمريضية الموحدة والآمنة.

الكلمات المفتاحية: تدابير الألم, احتشاء عضلة القلب الحاد, معارف الممرضين, البرنامج التعليمي.

Abstract

Background: Pain management is a compelling and universal requirement in nursing care; despite significant progress, untreated pain's adverse physiological and psychological effects are still largely unresolved, especially for acute myocardial infarction patients.

Objectives: This study aims to assess the nurses' knowledge and the effectiveness of the educational program on chest pain management for patients with acute myocardial infarction in the coronary care unit.

Methodology: A pre-experimental design (one group, pre-test, and post-test) was used to conduct this study in the coronary care unit at Al-Diwaniyah Teaching Hospital from (15th November 2021 to 28th April 2022). A non-probability (purposive) sample

was used to test (30 nurses/e) working in the coronary care unit.

Results: The results of the study showed that there were highly statistically significant differences between the nursing staff's knowledge scores in two levels of measurements (the pre-test and the post-test) with a probability value of (0.000), as the statistical average of the nursing staff's total knowledge scores in the pre-test was low (1.5) and after implementation of the educational program the results showed that there were statistically significant differences in the knowledge of nurses in the post-test.

Conclusion: The study concluded that the educational program positively affects nurses' knowledge of chest pain management for acute myocardial infarction patients in the Coronary Care Unit.

Recommendations: The study recommended the necessity of activating the work of the Continuing Nursing Education Unit properly to give training courses to nurses working in the coronary care unit related to chest pain management using pharmacological and non-pharmacological methods for acute myocardial infarction patients, in addition to establishing a written and updated protocol on pain management to confirm the adequacy of Standardized and safe nursing knowledge and practices.

Keywords: Pain Management, Acute Myocardial Infraction, Nurses' knowledge, educational program.

INTRODUCTION

Acute myocardial infarction is one of the most prevalent health conditions and the top cause of mortality worldwide [1]. It's a medical term for a situation in which severe myocardial ischemia develops quickly. The average recurrence of treated acute myocardial infarction patients was increased big props to successful system-of-care organizational strategy, managed to improve in-hospital acute myocardial infarction therapies and better options for the control of long-term risks for heart failure and prevention complications. Generally, treatment methods for acute myocardial infarction are administered immediately following the beginning of symptoms in affluent nations, resulting in minor cardiac damage and brief hospital stays [2].

To provide effective treatment, it is necessary to alleviate patients' pain and suffering. Quality of life, physical performance, social relationships, and psychological wellbeing are all affected by pain. Other problems such as tiredness, sleeplessness, lack of appetite, and stress are usually associated with the pain [3]. Pain relief is a fundamental nursing objective reflected in the philosophy's professions. Nurses are in charge of performing routine pain evaluations, administering medications, and evaluating patient responses. For these tasks, it is necessary to understand the nature of a patient's clinically relevant pain [4].

Although it is a significant problem for all health care providers, nurses' inadequate knowledge, negative attitudes, incorrect assessment skills and unwillingness to act as patient advocates pose substantial obstacles to pain relief for acute myocardial infarction patients [5]. Nurses should have information about pain assessment and management, appropriate medication use, and sound monitoring. Inadequate pain management and lack of experience among the nurses working in the coronary care unit significantly affect patient care. The more nurses know about the pain, the more influential the management and the faster the pain relief [6, 7].

This study aimed to improve nursing care by boosting coronary care nurses' expertise in chest

pain management for patients with acute myocardial infarction by measuring their knowledge in this area. The data in this study contribute to the advancement of nursing care for patients with AMI by demonstrating the effectiveness of pharmacological and non-pharmacological pain treatment (The researcher).

Importance of the Study

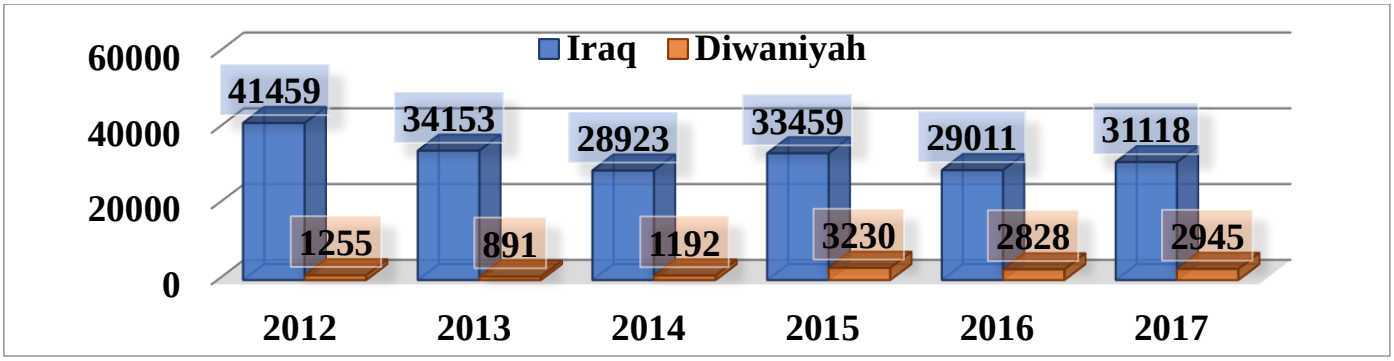
Cardiovascular disease is by far the leading cause of death globally. In 2012, 17.5 million individuals died from CVDs, accounting for 31% of global mortality; 42% of those deaths were related to coronary artery disease. CVDs accounted for 17% of all fatalities in 2014, according to the most recent WHO data [8]. In 2015, it was estimated that over 17.7 million people worldwide died of cardiovascular disease, accounting for 31% of all deaths, with 7.4 million deaths attributed to coronary artery disease and 6.7 million to stroke [9].

According to Iraq's Ministry of Health (MOH), coronary heart disease is prevalent, particularly in Al-Diwaniyah city. It can be a severe occurrence that results in abrupt death or significant hemodynamic deterioration [10].

Aims of the Study

This study aims to assess the nurses' knowledge and the effectiveness of the educational program on chest pain management for patients with acute myocardial infarction in the coronary care unit.

Figure 1: Prevalence of Coronary Heart Diseases in Iraq and Al-Diwaniyah city between 2012-and 2017.



METHODOLOGY

Study Design

A pre-experiment design (one group pretest-posttest design) has been applied to obtain the study goals.

The setting of the Study

The study was done in Al-Diwaniyah Teaching Hospital at the Coronary Care Unit (CCU). Duration of study beginning from (15th November 2021) to (28th April 2022). The researcher had chosen this hospital because of the only teaching hospital that contains CCU in Al-Diwaniyah City. The nurses in the CCU are cooperative, allowing the completion of data collection within a limited period. This hospital is equipped with educational facilities that may ease the program's implementation, such as the academic hall with its contents.

Sample of the Study

A non-probability (purposive) sample was chosen to obtain representative and accurate data. Of the total (41) nurses working at CCU in Al-Diwaniyah Teaching Hospital, (11) nurses were excluded from the educational program (five nurses for the pilot study, four nurses who previously participated in chest pain management courses, and two nurses who did not complete the program). So, the total number of nurses participating in the

program the study was (30) nurses. The sample was taken in one group.

Construction of the educational Program

The program is established and designed based on the preliminary assessment of nurses' knowledge about chest pain management for patients with acute MI at CCU and the information obtained from the related scientific literature and previous studies. A group of experts reviews the program content.

The experts explained their notes and recommendations by carrying out a complete review of the program's content and meeting the requirement of nurses and the research objectives. Educational program content includes information about the heart (location and function), acute MI (definition, signs and symptoms, causes, risk factors, pathophysiology, manifestations, management, and complications), pain management (overview of the pain, types, assessment of the pain, tool assessment, characteristics, Pharmacological and non-pharmacological management and nursing roles).

Instrument Format

To achieve the objectives of the study, the researcher built the study tools about the nurses' knowledge of chest pain (acute pain) managements for patients with AMI. Consisting of the educational program and the knowledge questionnaire, where the questionnaire consisted of two parts (the first part concerned demographic information for the nurses participating in the study, while the second part consisted of (24) questions about the nurses' knowledge of chest pain managements for acute myocardial infarction patients. The credibility of the questionnaire and the educational program was verified by presenting it to (18) experts.

Reliability of the Questionnaire

The reliability of the questionnaire was determined by utilizing a test and re-tests methods gained by assessing (five) nurses employed at CCU in Al-Diwaniyah Teaching Hospital, and the interval period was two weeks to identify the reliability of the study instrument. The finding of the reliability shows that the person correlation coefficient is ($r = 0.88$), which is a statistically acceptable match to the minimum reliability coefficient. The result gathered through the pilot study displayed how clear and understandable the questions were, and the time was (20-30) minutes to complete the questionnaire.

Statistical Data Analysis

Statistical Package for Social Sciences (SPSS, version 23) analyses the study data. And Microsoft Excel to display the differences between the pre-and post-test for the study sample.

RESULTS

Table (1): The Distribution of the Study Samples according to the Demographical Data.

Variable	Groups	Results	
		Freq.	%
Age Groups	20-25	15	50
	26 – 30	9	30
	31 – 35	4	13.3
	36 – 40	2	6.7
	Total	**30**	**100**
Gender	Male	12	40
	Female	18	60
	Total	**30**	**100**
Educational level	Preparatory Degree in Nursing	3	10
	Diploma Degree in Nursing	11	36.7
	Bachelor's Degree in Nursing	15	50
	Higher Degree in Nursing	1	3.3
	Total	**30**	**100**
Years of Experience in Nursing	Five years or less	18	60
	6-10	9	30
	11-15	2	6.7
	16-19	1	3.3
	Total	**30**	**100**
Years of Experience in CCU	Five years or less	15	50
	6-10	9	30
	11-15	6	20
	Total	**30**	**100**
Sharing in training sessions related to Pain management	Yes	0	0
	No	30	100
	Total	**30**	**100**
Educate themselves about the knowledge of chest pain management	Yes	6	20
	No	24	80
	Total	**30**	**100**
Method non-pharmacological for pain management	Yes	17	56.7
	No	13	43.3
	Total	**30**	**100**

Table (1) presented that half of the study sample (50) per cent were within the age group (20 - 25) years old, and 60 per cent of them were female. Moreover, results showed that half (50 per cent) of the study sample had a bachelor's degree in Nursing. In addition, the research findings presented that 60 per cent of the study sample have five years or less of experience in nursing, while half of the study sample have five years or less of experience in CCU. All study samples (100) per cent were not shared in training sessions related to pain management. Furthermore, most of the study sample (80) per cent did not educate themselves about pain management, and (56.7) per cent have known non-pharmacological methods for pain management.

Table (2): Distribution of nurses' knowledge about chest pain management.

L.	Items	Sample Response							
		Pretest				Posttest			
		Freq.		Mean	Ass.	Freq.		Mean	Ass.
		Wrong	Right			Wrong	Right		
1	The function of the heart	10	20	1.66	M	3	27	1.9	H
2	A normal heartbeat ranges	17	13	1.43	M	5	25	1.83	H
3	Responsible for providing the heart muscle with the blood and oxygen	21	9	1.3	M	4	26	1.86	H
4	Acute MI is a health problem that includes	22	8	1.26	M	7	23	1.76	H
5	Diagnostic tools are most commonly used to locate acute MI	24	6	1.2	L	8	22	1.73	M
6	A most common symptom of myocardial infarction	26	4	1.13	L	9	21	1.7	M
7	Complications of myocardial infarction	24	6	1.2	L	5	25	1.83	H
8	Definition of the Pain	24	6	1.2	L	3	27	1.9	H
9	The pain associated with acute myocardial infarction is classified based on	20	10	1.33	M	3	27	1.9	H
10	Responsible for the perception of pain	21	9	1.3	M	7	23	1.76	H
11	Assessment of chest pain associated with acute MI	20	10	1.33	M	10	20	1.66	M
12	The range of numerical assessment scales for pain	21	9	1.3	M	5	25	1.83	H
13	Physical reactions to acute MI pain	24	6	1.2	L	5	25	1.83	H
14	Disadvantages of visual analogue scale(VAS)	22	8	1.26	M	8	22	1.73	M
15	The time is taken for the effect of IV morphine on patients with acute MI	25	5	1.16	L	5	25	1.83	H
16	Indicators of the severity of chest pain in patients with acute MI	25	5	1.16	L	10	20	1.66	M
17	Reason for the patient to request an increase in the dose of pain relievers for patients with acute MI	26	4	1.13	L	7	23	1.76	H
18	Non-pharmacological management to control chest pain include	28	2	1.06	L	17	13	1.43	M
19	Non-pharmacological management to control chest pain are	28	2	1.06	L	8	22	1.73	M
20	Analgesic dose for patients with acute MI of intravenous morphine	24	6	1.2	L	7	23	1.76	H
21	Essential instructions for patients with acute MI about medication self-care	23	7	1.23	L	5	25	1.83	H
22	Angie tablets work faster when	26	4	1.13	L	11	19	1.63	M
23	Aspirin and Plavix are used to prevent blood clots from forming after	25	5	1.16	L	7	23	1.76	H
24	It should not be taken when the stomach is empty	27	3	1.1	L	6	24	1.8	H

Ass. = Assymptomatic significant; H. = High (1.75-2); M. = Moderate (1.25-1.75); L. = Low (1. – 1.25), freq.= frequency.

Table (2) showed significant differences in the mean of the study sample responses between the pre and post-test, which revealed a considerable improvement in the participants' knowledge of pain management.

Table (3): Comparison of the significance of pre and post-test knowledge scores.

Score	N	M	SD	t	df	P. value	Sig.
Pretest and Posttest knowledge	**30**	**1.5**	**0.68**	**12.04**	**29**	**.000**	**H.S**

N= number, M = mean of score, SD= standard deviation, NS =non-significant at P>0.05, S= significant at P<0.05.

Table (3) presented a highly significant difference in the knowledge between pre-test and post-test scores at a p-value (.000).

DISCUSSION

Discussion of the Nurses' Demographic Characteristics in the CCU of the Study Sample, in Table (1):

The study results revealed that half of the study sample (50%) were within the age group (20 - 25) years old. The development of the study was supported by a study conducted by Ahmed & Abed (2020) that reported the percentage (42.3%) of participants in the age group (20-25) years. Regarding gander for study participants to these findings, female nurses comprise most of the study's sample (60%), while male nurses comprise the minority (40%). Similar to the findings of Skal & Ahmed (2021), which showed the study's participants were female (60%) and Al-Ganmi (2013), the majority of the study's participants were female (58.0%). And a survey conducted by Germossa et al. (2018) disagreed with the current study findings, which showed that determining the impact of an in-service educational program on nurses' knowledge and attitudes regarding pain management in an Ethiopian university hospital, the result indicated that the highest percentage (59.5%) is male [11, 12].

In table (1), regarding the level of education, the study shows that half (50%) of the study sample has a bachelor's degree in nursing, followed by those with a diploma in nursing (36.7%). This result is consistent with Ahmed & Abed (2020), who reported the percentage of bachelor's degrees in nursing (69.2%) followed the rate of a diploma in nursing (30.8%). A study's results by Skal and Ahmed (2021) are inconsistent with the results of the current research, which acknowledged that most of the participants (32.5%) were bachelor's degrees in nursing, while a diploma in nursing reported the percentage (22.5%) [1, 7].

According to the study and the researcher's point of view that explains the increase in academic nurse numbers in the CCU, the CCU requires highly skilled nurses. Another cause is the establishment of the College of Nursing in the AL-Diwaniyah Governorate in previous years, which resulted in the provision of academic nurses in adequate numbers to health facilities.

Regarding years of experience in nursing, the study revealed that more than half of the study sample (60%) had less than five years of experience working as a nurse. Ahmed et al. (2019) and Skal & Ahmed (2021) that half study's sample (50.0%) had less than five years of experience in nursing supported the findings of the current research and reported that most of the examples of the study had less than five years of experience in nursing [1, 13].

On the other hand, regarding years of experience in the CCU, the survey indicated that most participants (50%) had less than five years of experience. The findings were discovered in a research done by Fashakh & Kadhem (2016), which revealed that the majority of nurses (62%) had less than five years of experience, which supports the

current study's findings. The researcher confirmed that the highest percentage of nurses were young and had low experiences in the CCU [14].

In the table (1), regarding the training courses about pain management, the study's findings explain that all nurses (100 %) don't have training courses in chest pain management. This finding from the current research agrees with a study conducted by Ahmed & Abed (2020). The researcher affirms that these findings were regarding the lack of courses related to pain management in the hospital and did not action the Continuous Medical Education Unit in the hospital correctly [7].

Concerning the educate themselves about the knowledge of chest pain management, the results of the study demonstrated that (80%) of the sample did not educate themselves about the understanding of chest pain management for patients with acute MI; the nurses at CCU in AL-Diwaniyah Teaching Hospital have no available resources of the information to improve their knowledge about chest pain management. In addition to the absence of continuous monitoring and assessment necessary to maintain the correct expertise, the Training and Development Center does not work training and educational courses to meet nurses' needs. It raises the workload of receiving patients injured in acute MI and other emergency conditions. On the other hand, some nurses were involved in other work after the end of the hospital hours and did not have time to reads.

Regarding non-pharmacological pain management methods, the study results showed that about (56.7%) know non-pharmacological methods. The results found by Ahmed and Abed (2020) agreed with the current study findings, which showed that most of the study sample had (65.4%) knowledge about non-pharmacological methods of chest pain management [7].

Discussion of Nurses' Knowledge about chest Pain Management for Patients with Acute MI in the CCU at Pre-Test and Post-Test (After implementing the educational program), as Offered in the Tables (2) and (3):

The importance of chest pain management for patients with acute MI is well documented. It is known that pain management is essential to decrease the complication and mortality rate among those patients in the CCU. As in Table (2), the study showed that the nurses' knowledge about chest pain management for patients with acute MI in CCU was poor in the pre-test period. The statistical mean of the overall understanding of nurses participating in the study was (1.5), as shown in table (2). And the general assessment of their knowledge was low.

The result of this study is consistent with the survey conducted in Baghdad city in 2020 by Majeed et al., where only (48.1%) of nurses in the study sample had good knowledge about pain management. Another study on survival data management in patients with acute myocardial infarction conducted by Vernic et al. (2017) found the nurses in the study had inadequate knowledge management of patients with acute MI [15, 16].

The study conducted by Alasiry and Löfvenmark (2013) about nurses' perceptions of pain assessment and pain management for patients with myocardial infarction in the CCU. The study demonstrated some barriers, obstacles, and difficulties during pain assessment or pain management. The study recommended that the nurses need more skills and knowledge to practice good pain assessment and effective pain management when dealing with patients who have MI pain [5].

This result can be explained from the researcher's point of view that the lack of knowledge about chest pain management among the CCU nurses can be attributed to many reasons, including; the lack of education or training courses on this topic,

continuing education in hospitals do not give proper attention to pain management in their curriculum. And let's not forget, in the past four years, the Coronavirus has had a significant impact on the workflow through strict safety and prevention measures.

The post-test period showed improvement in the nurses' knowledge about pain management for patients with acute MI after implementing the educational program, as shown in table (2). The overall evaluation of the nurses' knowledge was high with a statistical mean. The study revealed highly statistically significant differences between the general nurses' knowledge in pre and post-test periods (p-value= 0.000).

These findings are similar to those in the study done by Saied and Mansour (2021), where they reported that there are statistically significant differences between the nurses' knowledge about pain management in pre-test and post-test, where they found that there is an improvement in the nurses' knowledge after conducting the pain management educational program [3].

This result is consistent with the study conducted by Salim et al. (2020) that determines the impact of a pain management program on nurses' knowledge of pain. In the same context, a study by Khader (2016) found highly significant differences between nurses' knowledge about pain management before and after the implementation of the educational program sessions [4, 17].

These results revealed by Hussein (2016) that the implementation of the educational program had a positive effect on the nurse's knowledge about pain assessment and management; the total level of knowledge response of the study sampling to the post-education test was good [20].

This finding is in line with the data reported by Shalabia et al. (2015) to determine the impact of a brief educational program on nurses' knowledge and practices toward pain management. The educational program's effectiveness on nurses' knowledge and practices is confident and optimistic. In addition, Gustafsson & Borglin (2013) found that following the intervention program, the total mean score is improved [18, 19].

Depending on these results shown in the table (2 and 3), there were significant differences in the mean of the study sample responses between the pre and post-test, which revealed a high improvement in the participants' knowledge of chest pain management. The educational program has a positive impact on improving the nurses' knowledge concerning chest pain management for patients with acute MI. Nurses' learning can be raised and enhanced by concluding that all nurses can continuously use the educational program in the CCU. A conclusion can also be applied to improve nurses' knowledge as a research process to solve actual or potential problems occurring in any health condition and give patients the best quality of management. These results may encourage all concerned to embrace more similar goals in their curricula in future.

CONCLUSION

The educational program has effectively improved nurses' knowledge about chest pain management for patients with acute MI.

RECOMMENDATIONS

Nurses are encouraged and motivated to participate in special training programs about pain assessment and management.

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REFERENCES:

1. Skal, B. M., & Ahmed, S. A. (2021). Effectiveness of an Educational Program on Nurses' knowledge about Risk Factors for Bleeding of Acute Myocardial Infarction in Patient Receiving Thrombolytic Therapy at Coronary Care Unit in Al-Diwaniyah Teaching Hospital. *Indian Journal of Forensic Medicine & Toxicology*, 15(3).
2. Abdi, A., & Basgut, B. (2016). An evidence-based review of pain management in acute myocardial infarction. *J Cardiol Clin Res*, 4(4), 1067. https://www.jscimedcentral.com/Cardiology/cardiology-4-1067.php.
3. Saied, D. R., & Mansour, K. A. (2021). Effectiveness of an Educational Program on Nurses' Knowledge and Attitudes about Pain Assessment and Management in Imam Hussein Medical City in Holy Karbala. *Indian Journal of Forensic Medicine & Toxicology*, 15(3). https://www.annalsofrscb.ro/index.php/journal/article/view/9434.
4. Salim, N. A., Tuffah, M. G., & Brant, J. M. (2020). Impact a pain management program on nurses' knowledge and attitude toward pain in United Arab Emirates: Experimental-four Solomon group design. *Applied Nursing Research*, 151314. DOI: 10.1016/j.apnr.2020.151314
5. Alasiry, S., & Löfvenmark, C. (2013). Nurses' perceptions of pain assessment and pain management for patients with myocardial infarction in a coronary care unit. *Middle East J Nurs*, 7(5), 9-22. DOI:10.5742/MEJN.2013.75327
6. Germossa, G. N., Sjetne, I. S., & Hellesø, R. (2018). The impact of an in-service educational program on nurses' knowledge and attitudes regarding pain management in an Ethiopian university hospital. *Frontiers in public health*, 6, 229.
7. Ahmed, R. G & Abed, R. G. (2020). Effectiveness of an Educational Program on Nurses Knowledge and Practices Concerning Pain Management at Cardiac Care Unit in Baqubeh Teaching Hospital. [unpublished Master Thesis]. University of Baghdad.
8. Mirza, A., Aslam, S., Perrin, K., Curtis, T., Stenback, J., Gipson, J., & Alrabaa, S. (2016). Knowledge, attitudes and practices among patients with coronary artery disease in Dhaka, Bangladesh. *Int J Community Med Public Health*, 3(10), 2740-2748.
9. Shahwan, A. J., Abed, Y., Desormais, I., Magne, J., Preux, P. M., Aboyans, V., and Lacroix, P. (2019). Epidemiology of coronary artery disease and stroke and associated risk factors in Gaza community–Palestine. PloS one, 14(1), e0211131. https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0211131.
10. Omran, A. A. (2019). Effectiveness of an Instructional Program on Patients' Knowledge about Self-Care for Post-Acute Coronary Syndrome in Al-Diwaniyah Teaching Hospital. (anpuplished master thesis, Iraq (P.P. 18).
11. Al-Ganmi, A. H. A. (2013). Assessment of Nurses' Knowledge Concerning Cardiogenic Shock for Patients' in Cardiac Care Unit at Baghdad Hospitals. *kufa Journal for Nursing sciences*, 4(2), 76-45.
12. Ahmed, S. A., Jasim, A. H., Katea, M. J., Foaad, A. S., Hashim, H. A., & Noori, D. A. (2019. Assessment of Nurses' knowledge concerning Prevention of Central Venous Catheter Infection in Intensive Care Units at Baghdad Teaching Hospitals. *kufa Journal for Nursing sciences*, 9(1), 1-7.
13. Fashakh, A. A. H. N., & Kadhem, H. Y. (2016). Effectiveness of nursing intervention on patients with acute myocardial infarction in cardiac centers at Baghdad city hospitals. *Kufa journal for nursing sciences*, 6(2), 12-15.
14. Majeed, H. M., Hassan, A. F., & Abid, R. I. (2020). Evaluation of nurses' knowledge and attitudes toward pain management at Baghdad Teaching Hospitals. *Indian Journal of Forensic Medicine & Toxicology*, 14(2), 1575-1579.
15. Vernic, C. V., Ivan, V., Dascălu, C. G., & Cărăuşu, E. M. (2011). Survival data management in patients with

acute myocardial infarction. Annals. *Computer Science Series*, 9(1).

16. Khader, K. A. (2016). Effect of Educational Programs on Knowledge and Attitudes of Surgical Nurses Regarding Pain in Taif Hospitals. *Int J Multidisc Curr Res*, 4, 256-259. Research Article Available at: http://ijmcr.com.

17. Malik, M. A., Khan, S. A., Safdar, S., & Taseer, I. U. H. (2013). Chest Pain as a presenting complaint in patients with acute myocardial infarction (AMI). *Pakistan journal of medical sciences*, 29(2), 565.

18. Shaaban Khalil, N., Sayed Ismaeel, M., & Sayed Ewees, A. (2018). Thrombolytic therapy in acute MI: coronary care nurses' knowledge and practice. *British Journal of Cardiac Nursing*, 13(8), 376-384.

19. Hussein, A. M. F., & Hassan, H. S. (2016). Effectiveness of Educational Program on Nurse's Knowledge Concerning Management of Cardiogenic Shock at AL-Mosul Teaching Hospitals. *kufa Journal for Nursing sciences*, 6(1), 154-162.

20. Hamza, R. A. (2012). Efficiency of nursing management Toward Pain. *kufa Journal for Nursing sciences*, 2(3), 9-14. https://www.researchgate.net/publication/316273822_Efficiency_of_Nursing_management_Toward_Pain.