# Effectiveness of an Educational Program on Nurse's knowledge concerning Complications of Cardiac Catheterization among Children at Al-Nassirhya Heart Center

# فاعلية برنامج تعليمي على معارف الممرضين المتعلقة بمضاعفات القسطرة القلبية بين الأطفال في مركز الناصرية للقلب

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**الخلاصة**

**الهدف:** تقييم معارف الممرضين المتعلقة بمضاعفات القسطرة القلبية بين الأطفال، ولإيجاد العلاقة بين معارف الممرضين المتعلقة بمضاعفات القسطرة القلبية بين الأطفال والمعلومات الديموغرافية الاجتماعية.

**المنهجية:** :دراسة وصفية أجريت في مركز الناصرية للقلب خلال الفترة من الثامن من تشرين الثاني من العام 2015إلى حزيران2016.عينة غير احتمالية هادفة من (25) ممرض، ممن يعمل في قسم تشوهات القلب الخلقية والتي تشمل ردهات الأطفال و مختبر قسطرة القلب المتخصصة في أمراض القلب للأطفال في مركز الناصرية للقلب. أداة الدراسة اشتملت على الاستبيان الذي يحوي ستة أجزاء رئيسية .دقة الاستبيان حددت من خلال الاتساق الداخلي من خلال دراسة تجريبية، صدق محتوى استبيان حدد من خلال مجموعة الخبراء .وقد تم تحليل البيانات من خلال تطبيق التكرارات الوصفية والنسب المئوية والمتوسط من النتيجة والتحليل الإحصائي ألاستنتاجي :اختبار F

**النتائج** :أظهرت الدراسة عدم وجود ارتباط ذات دلالة إحصائية بين عمر الممرضين ومعارفهم بشأن مضاعفات القسطرة القلبية في ما قبل الاختبار وما بعد الاختبار الأولوالثاني من البرنامج التعليمي قيمة,(P> 0.05) هناك عدم وجود ارتباط ذي دلالة إحصائية بين جنس الممرضين ، و مستوى التعليم، والدخل الشهري، وبيئة السكن، وسنوات الخدمة في مجال التمريض، سنوات الخبرة في مراكز القلب والدورات التدريبية حول قسطرة القلب ومعارفهم بشأن مضاعفات قسطرة القلب .وخلصت الدراسة إلى أن نسبة عالية من الكادر التمريضي هم من خريجي معهد التمريض ومعظمهم لم يشارك في الدورات التدريبية حول قسطرة القلب.

**الاستنتاج:** (1)اغلب عينة الدراسة كانوا من الذكور (2) اغلب أعمار عينة الدراسة كانت بين (25-29)سنة.(3) نسبة عالية من العينة لم تشارك في الدورات التدريبية حول القسطرة القلبية.(4) هناك تباين ذو أهمية بين الفترتين (الاختبار القبلي والاختبار البعدي الأول) لعينة الدراسة في كل ما يتعلق( بمعلومات الممرضين المتعلقة بالقسطرة القلبية ومضاعفاتها).

**التوصيات** :أوصت الدراسة بما يلي: (1) بضرورة تطوير مهارات الممرضين. (2)إعطاء فرصة للمشاركة في الدورات التدريبية لتحسين الرعاية التمريضية التي تقدم للطفل وأسرته خلال عملية قسطرة القلب.

**مفاتيح الكلمات**: **فاعلية برنامج تعليمي ,القسطرة القلبية للأطفال ,المضاعفات.**

**Abstract**

**OBJECTIVE:** To assess nurses' knowledge concerning complications of cardiac catheterization among children and to find out the relationships between the nurses' knowledge concerning complications of cardiac catheterization among children and socio-demographic information.

**METHODOLOGY:** a descriptive study was carried out at Al-Nassirhya Heart Center During the period from November 8th -2015 to the Wednesday June -2016. A non-probability (purposive) sample of (25) nurses, who worked at congenital heart anomalies department which include pediatric wards and cardiac catheterization unit. specialized in pediatric cardiac diseases in AL Nasiriyah Heart Center.

The tool of the study included a questionnaire, which has six main parts. The Reliability of questionnaire was determined through internal consistency and through a pilot study, and the content validity of the questionnaire was determined through an expert panel. The data were analyzed through the application of descriptive frequencies, percentages, mean of score and the inferential statistical analysis: F test.

**RESULTS:** The study revealed that there is no statistical significant association between nurses' age and their knowledge concerning the complications of cardiac catheterization at (pre test, post-1 and post-2) of educational program follow up (p value > 0.05). There is no statistical significant association between nurses' gender, nurses' level of education, monthly income, residential area, years of service in nursing field, nurses' years of experience in heart centers and training course about cardiac catheterization and their knowledge concerning the complications of cardiac catheterization. The present study concluded that high percentage of staff nurses were graduated of Nursing Institute and most of them did not participate in training courses about cardiac catheterization.

**CONCLUSIONS** :(1) Most study sample was males. (2)Mostly the ages of study sample were (25-29) Year. (3) A High percentage of the sample did not participate in training courses concerning to cardiac catheterization. (4)Highly significant differences between the two periods (pre and post-1 tests) of study sample in all domains of **(**nurses' information about cardiac catheterization and its complication in pediatric

**RECOMMENDATION:** (1) The study recommended the necessity to develop the nurses' skills. (2) Giving chance to nurses to participate in training courses to improve nursing care provided to the child and his family during cardiac catheterization procedure.
**Key Words: Effectiveness of an educational program, Pediatric Cardiac Catheterization, Complications.**

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# INTRODUCTION

Cardiac Catheterization (CC) is a term that refers to the passageway of a fine tube into the cardiac chambers throughout a vein or an artery, usually from the right femoral or radial area, although often the umbilical vessels are utilized. In infants with congenital heart diseases, the femoral approach permits movement of a catheter into the left side of the heart during a patent foramen ovale, a ventricular defect or an atrial septal defect[(1)(2)].

Indication of pediatric cardiac catheterization includes: -Collects blood samples and pressure measurements within the various chambers of the heart.-Provides information about the effects of the heart crisis on the function of the heart and lungs. -Interventional cardiac catheterization leads to avoid surgery with all its related risks, wounds and lengthy hospitalization [(1) (2)].Cardiac catheterization is helpful in excluding pulmonary artery branch stenosis and shunt stenosis or occlusion.-Cardiac catheterization is indicated to determine shunt size and severity if an excessive residual, left-to-right shunt is suspected following closure of a ventricular septal defect that included atrioventricular canal patch up[(3)].

Cardiac catheterization rapidly became a common procedure in pediatric catheterization. Various advances occurred in the 1980s and 1990s. Increasing minimally invasive procedures has strained the traditional model of anesthesia-directed care in the operating room environment with a diversity of providers now administering analgesia and sedation for children [(4)].

Pediatric cardiac catheterization procedures are listed in following types; 1-**Diagnostic**: These explain heart and vascular anatomy measuring haemodynamic pressures and shunts pulmonary hypertension studies using Coronary angiography and endosonography, nitric oxide, myocardial and endomyocardial biopsy.**2-Interventional catheterization**: it is a procedure that include ValvuloplastySeptal defect closure, Atrial septostomy Angioplasty and placing of stents, Percutaneous valve placements ,Closure of systemic to pulmonary shunts, e.g. patent ductusarteriosus and Hybrid procedure. **3-For Electrophysiological studies:** Conduction system mapping, Radiofrequency and cryoablation Placement of pacemaker and implantable cardioverter defibrillator [(1)(5)].

Transcatheter procedure: one of these procedures Hybrid procedures: Those are a significant performance in many PCCLs. An interventional cardiologist and a cardiac surgeon perform these procedures jointly or cooperatively. They are often performed in infants who have a thoracotomy offered the surface of the heart. Interventional catheterization procedures are performed with access provided directly through the anterior wall of the right ventricle or the main pulmonary artery (PA) [(6)].

Complications of closure of patent ductusarteriosus include congestive heart failure, recurring chest infections, pulmonary hypertension, and an increased risk of infective endocarditis. Trans catheter closure of patent ductusarteriosushas largely subrogated surgical ligation in different age groups[(7)].

Complication of Cardiac Catheterization in Children includes Hypoventilation: Hypoventilation, oxygen desaturation, apnea or even bradycardia demands cardiopulmonary resuscitation and/or endotracheal intubation have been reported as AE. Risk factors for hypoventilation are sedative drugs, anomalies, gastro esophageal reflux, high physical restraint, congenital airway pulmonary vascular resistance, jugular or subclavian venous puncture, Down's syndrome with a large tongue, short chin, and newborns enduring prostaglandin infusion **(8).**Paroxysmal pulmonary artery hypertension crisis (PPHC): It occurs in patients with long-term pulmonary arterial hypertension, can be another life-threatening complication during Cardiac Catheterization**(9).**

Vascular Complications: Femoral artery damage or damage after pediatric Cardiac Catheterization includes bleeding, hematoma, arteriovenous fistula, pseudo aneurysm, thrombosis and occlusion **(10).**

## OBJECTIVES:

1-To find out the effectiveness of an Educational Program on Nurses' knowledge concerning complications of pediatric cardiac catheterization.

2-To find out the relationships between the nurses' knowledge concerning complications of cardiac catheterization among children and socio demographic data.

## METHODOLOGY:

**Administrative Arrangement:-**After getting the approval of the council of Nursing College for the study, the researcher submitted a detailed description including the objectives and methodology of the study to the Ministry of Planning (Central Statistical Organization and to the Thi-qar Health Directorate ( Training and Development department) in order to obtain an official permission.

**SETTING OF THE STUDY:** The study was conducted in the congenital heart anomalies department, which include pediatric wards cardiac catheterization lab. which is specialized in pediatric cardiac diseases in AL Nasiriyah Heart Center, Director Dhi-qar, Iraq. The study was carried out during the period from 8th November 2015 to Sunday May 2016.

**DESIGN OF THE STUDY:** A (quasi experimental) study was carried out to assess the Effectiveness of an educational program on Nurses' knowledge concerning Complications of Cardiac Catheterization among Children at Al-Nassirhya Heart Center.

**THE SAMPLE OF THE STUDY:** A non-probability (purposive) sample of (25) nurses was chosen. All the nurses are working at congenital heart anomalies department in the AL Nasiriyah Heart Center.

**THE STUDY INSTRUMENTS:** For the purpose of the present study, a questionnaire was conducted by the researcher, The questionnaire was used before and after conducting a special program designed to increase the knowledge of the sample, Scale of the questionnaire is (multiple choice)(32 questions) the correct answer code was (2) and the wrong answer code was (1) . The study instrument consisted of (6) parts. Part I: Socio-demographic information of the nurses. Part II: Information concerning the workplace: It consists of (4) items related to the workplace section including years of experience in specialization heart center, training courses and years of service in general. Part III: Training course about cardiac catheterization: It consists of items related to training courses participated at cardiac catheterization, number of courses, places and the periods of these courses. Part IV: Nurses knowledge about cardiac catheterization and its complications in

pediatrics Part V: Information related to nursing care before the procedure of pediatric cardiac catheterization .Part VI: Nursing management of the postoperative cardiac catheterization.

**DATA COLLECTION:** The data were collected after conducting a pre test questionnaire, applying the program then the post test by the personal direct intervention of the researcher. The data collection process was performed for the period from 1st of March until the 5th of April 2016.

**STATISTICAL ANALYSIS:** The following statistical data were obtained by using the analysis approach (SPSS-ver.20) to analyze and assess the data of the study Descriptive Data Analysis and Inferential statistical analysis that include F test.

## RESULTS:

**Table (1) distribution of the study sample according to their socio-demographic information**

| Variables | | No. | % |
|---|---|---|---|
| Age/Years | 20-24 | 5 | 20.0 |
| | 25-29 | 11 | 44.0 |
| | 30-34 | 7 | 28.0 |
| | 35-39 | 2 | 8.0 |
| | Total | 25 | 100.0 |
| Gender | Male | 16 | 64.0 |
| | Female | 9 | 36.0 |
| | Total | 25 | 100.0 |
| Educational level | Nursing school | - | - |
| | Nursing preliminary | 8 | 32.0 |
| | Nursing Institute | 14 | 56.0 |
| | College of nursing | 3 | 12.0 |
| | Total | 25 | 100.0 |
| Monthly income | Sufficient | 6 | 24.0 |
| | Somewhat sufficient | 17 | 68.0 |
| | Insufficient | 2 | 8.0 |
| General experience. | 1-5 Years | 11 | 44.0 |
| | 6-10 Years | 10 | 40.0 |
| | 11-15 Years | 4 | 16.0 |
| | Total | 25 | 100.0 |
| Years of experience in specialized heart center | 1-3 Years | 12 | 48.0 |
| | 4-6 Years | 11 | 44.0 |
| | 7 Years and more | 2 | 8.0 |
| | Total | 25 | 100.0 |
| Training courses about cardiac catheterization | Yes | 7 | 28.0 |
| | No | 18 | 72.0 |
| | Total | 25 | 100.0 |

**No. = number, %= percentage**

Table (1) shows that the (44%) of the demographic characteristics of the study sample were at the age group (25-29) years old and most of them (64%) were males. Their level of education mostly was nursing institute (56%). Monthly income was sufficient somewhat (68%).The table also shows that (44%) of them was employed from (1-5) years with (1-3 Years) years of experience

in specialized heart centers (48%) and (28%) of them had training courses about cardiac catheterization, (12%) of them inside Iraq and (14%) were outside Iraq.

**Table (2): the levels of assessment through the "mean of score" among the three period (pre, post-1 and post-2) for effectiveness of an educational program.**

| Period | Level of Assessment | Frequency | Percent |
|---|---|---|---|
| Pre-test | ( 1.00 - 1.33 ) Low | 2 | 8 |
| | ( 1.34 – 1.67 )Moderate | 21 | 84 |
| | (1.68 – 2.00 ) High | 2 | 8 |
| | Total | 25 | 100 |
| | $\bar{x} \mp S.D$ | 1.4788±0.12781 | |
| Post 1-test | ( 1.00 - 1.33) Low | - | - |
| | (1.34 – 1.67 )Moderate | - | - |
| | ( 1.68 – 2.00 ) High | 25 | 100 |
| | Total | 25 | 100 |
| | $\bar{x} \mp S.D$ | 1.9775±0.02633 | |
| Post 2-test | ( 1.00 - 1.33) Low | - | - |
| | (1.34 – 1.67 )Moderate | - | - |
| | (1.68 – 2.00 ) High | 25 | 100 |
| | Total | 25 | 100 |
| | $\bar{x} \mp S.D$ | 1.98±0.02532 | |

**$\bar{x} \mp S.D.$ =Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.).**

Table (2) shows moderate level of assessment to the mean of score 21(84. %) of suggested group of assessment (1.34-1.67):2 for pre-test of study sample with a mean score and a standard deviation as (1.4788±0.12781). This table also, shows a high level of assessment to the mean of score 25(100%) of suggested group of assessment (1.68- 200):3 for post-1 test of study sample, with mean score and standard deviation (1.9775±0.02633) and 25(100.0%) of suggested group of assessment for the high level (1.68 – 2.00):3 for post-2 test of study sample, with a mean score and a standard deviation (1.98±0.02532).

**Table (3): Association of nurses' knowledge with the age**

| Variables | Nurses' Knowledge | | | |
|---|---|---|---|---|
| Age (Years) | No. | Pre-test Mean ± S.D. | Post test 1 Mean ± S.D. | Post test 2 Mean ± S.D. |
| 20-24 | 5 | 1.4438±.06011 | 1.9625±.03423 | 1.9562±.03563 |
| 25-29 | 11 | 1.4858±.14880 | 1.9830±.02149 | 1.9915±.01460 |
| 30-34 | 7 | 1.4688±.13975 | 1.9777±.02972 | 1.9777±.02362 |
| 35-39 | 2 | 1.5625±.13258 | 1.9844±.02210 | 1.9844±.02210 |
| Total | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |

| | | | |
|---|---|---|---|
| | F =.404<br>d.f.= 3<br>P = .752 | F = .717<br>d.f.= 3<br>P = .553 | F =2.754<br>d.f.= 3<br>P = 0.068 |

$\bar{x} \mp S.D.$ **=Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = F test , d.f. = degree of freedom, P = probability value.**

This table shows that there is no statistical significant association between nurses' age and their knowledge concerning the complications of cardiac catheterization at (pre test, post-1 and post-2)**.**

**Table (4): Association of nurses' knowledge with the gender**

| Variables | Nurses' Knowledge | | | |
|---|---|---|---|---|
| Gender | No. | Pre-test<br>Mean ± S.D. | Post 1<br>Mean ± S.D. | Post 2<br>Mean ± S.D. |
| Male | 16 | 1.5254±.12248 | 1.9844±.02282 | 1.9844±.01976 |
| Female | 9 | 1.3958±.09375 | 1.9653±.02900 | 1.9722±.03294 |
| Total | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |
| | | F =7.529<br>d.f.= 1<br>P = 0.012 | F = 3.323<br>d.f.= 1<br>P = 0.081 | F =1.346<br>d.f.= 1<br>P = 0.258 |

$\bar{x} \mp S.D.$ **=Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = F test, d.f. = degree of freedom, P = probability value.**

This table shows that there is statistical significant association between nurses' gender and their knowledge.

**Table (5): association of nurses' knowledge with level of education.**

| **Variables** | **Nurses' Knowledge** | | | |
|---|---|---|---|---|
| **Level of Education** | **No.** | **Pre-test<br>Mean ± S.D.** | **Post 1<br>Mean ± S.D.** | **Post 2<br>Mean ± S.D.** |
| **Nursing preliminary** | 8 | 1.5156±.08995 | 1.9688±.03735 | 1.9766±.02210 |
| **Nursing Institute** | 14 | 1.4129±.10046 | 1.9777±.01910 | 1.9799±.02902 |
| **College of nursing** | 3 | 1.6875±.03125 | 2.0000±.00000 | 1.9896±.01804 |
| **Total** | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |

| | | | |
|---|---|---|---|
| | F =11.72<br>d.f. = 2<br>P =0.00 | F = 1.616<br>d.f.= 2<br>P = 0.221 | F = 0.271<br>d.f.=2<br>P =0.765 |

$\bar{x} \mp S.D.$ **=Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = F test, d.f. = degree of freedom, P = probability value.**

This table shows that there is no statistical significant association between nurses' level of education and their knowledge.

**Table (6): Association of nurses' knowledge with the monthly income.**

| Variables | Nurses' Knowledge | | | |
|---|---|---|---|---|
| Monthly Income | No. | Pre-test<br>Mean ± S.D. | Post 1<br>Mean ± S.D. | Post 2<br>Mean ± S.D. |
| Sufficient | 6 | 1.5104±.12448 | 1.9740±.02352 | 1.9688±.03423 |
| Sufficient somewhat | 17 | 1.4688±.13844 | 1.9798±.02911 | 1.9853±.02242 |
| Insufficient | 2 | 1.4688±.00000 | 1.9688±.00000 | 1.9688±.00000 |
| Total | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |
| | | F =0.277<br>d.f. = 2<br>P =0.799 | F = 0.213<br>d.f.= 2<br>P = 0.809 | F = 1.178<br>d.f.=2<br>P =0.327 |

$\bar{x} \mp S.D.$ **=Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = Ftest,d.f. = degree of freedom, P = probability value.**

This table shows that there is no statistical significant association between nurses' monthly income and their knowledge.

**Table (7) : Association of nurses' knowledge with the general experience**

| Variables | Nurses' Knowledge | | | |
|---|---|---|---|---|
| General experience | No. | Pre-test<br>Mean ± S.D. | Post 1<br>Mean ± S.D. | Post 2<br>Mean ± S.D. |

| | | | | |
|---|---|---|---|---|
| 1-5 Years | 11 | 1.4517±.08879 | 1.9773±.02827 | 1.9744±.03068 |
| 6-10 Years | 10 | 1.4656±.15412 | 1.9750±.02465 | 1.9875±.01614 |
| 11-15 Years | 4 | 1.5859±.12069 | 1.9844±.03125 | 1.9766±.02992 |
| Total | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |
| | | F = 1.823<br>d.f. = 2<br>P = 0.185 | F = 0.169<br>d.f. = 2<br>P = 0.845 | F = 0.724<br>d.f. = 2<br>P = 0.496 |

**$\bar{x} \mp S.D.$ =Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = Ftest,d.f. = degree of freedom, P = probability value, < = Less than, ≥ = equal and more.**

This table shows that there is no statistical significant association between nurses' general experience nursing field and their knowledge

**Table(8): Association of nurses' knowledge with the general experience in specialist heart center**

| Variables | Nurses' Knowledge | | | |
|---|---|---|---|---|
| YEARS OF EXPERIENCE IN HEART CENTER | NO. | PRE-TEST MEAN ± S.D. | POST 1 MEAN ± S.D. | POST 2 MEAN ± S.D. |
| 1-3 YEARS | 12 | 1.4583±.08670 | 1.9766±.03017 | 1.9792±.03077 |
| 4-6 YEARS | 11 | 1.5114±.16902 | 1.9801±.02107 | 1.9801±.02107 |
| 7 YEARS AND MORE | 2 | 1.4219±.02210 | 1.9688±.04419 | 1.9844±.02210 |
| TOTAL | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |
| | | F =0.691<br>D.F. = 2<br>P = .512 | F = 0.160<br>D.F. = 2<br>P = 0.853 | F = 0.034<br>D.F. = 2<br>P = 0.967 |

**$\bar{x} \mp S.D.$ =Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = F test , d.f. = degree of freedom, P = probability value,< = Less than, ≥= equal and more.**

This table shows that there is no statistical significant association between nurses' years of experience in heart center and their knowledge.

**Table (9) : Distribution and Association of Nurses' Knowledge with Their Training course about cardiac catheterization.**

| Variables | Nurses' Knowledge | | | |
|---|---|---|---|---|
| Training course about cardiac catheterization | No. | Pre-test Mean ± S.D. | Post 1 Mean ± S.D. | Post 2 Mean ± S.D. |
| Yes | 7 | 1.6027±.11792 | 1.9866±.02459 | 1.9821±.02459 |
| No | 18 | 1.4306±.09680 | 1.9740±.02680 | 1.9792±.02626 |
| Total | 25 | 1.4788±.12781 | 1.9775±.02633 | 1.9800±.02532 |
| | | F = 14.149<br>d.f.= 1<br>P = 0.001 | F = 1.171<br>d.f. = 1<br>P = 0.29 | F = 0.067<br>d.f. = 1<br>P = 0.798 |

$\bar{x} \mp S.D.$ **=Arithmetic Mean ($\bar{x}$) and Std. Dev. (S.D.), No. = Number of frequencies, F = F test , d.f. = degree of freedom, P = probability value, ≥= equal and more.**

This table shows that there is no statistical significant association between nurses' training course about cardiac catheterization and their knowledge.

## DISCUSSION:

The findings of the study sample revealed that the majority of (44%) were at the age group (25-29) years old, the lowest (8%) were at the age group (35-39), most of study sample (64%) was males, and their level of education mostly was Nursing Institute (56%). The monthly income was Sufficient somewhat (68%) and their livings (92%) were urban areas (Table 1)this result is supported by **(11).**Who indicated that the majority of studied nurses were males (75.4 %), and other studies pointed out that the majority of studied nurses ages were between (20-29). Regarding the gender, the highest percentage (64%) of the study sample were males and the remaining (36%) were female. In addition, this agreed with the findings of the study done by another study. Who indicated that the majority of studied nurses were males.(64%) of the nurses in congenital heart anomalies department in the AL Nasiriyah Heart Center were males while the rest (36%) were females**(11)(12).** According to statistics received from the Associate Director of Nursing, at the hospital the study held in, most of the nurses (88%) believed that the monthly income salary was sufficient. As for to residency, the urban area get the highest percentage (92%). The sample consisted of (25) working nurses at congenital heart anomalies department in Al-Nassirhya Heart Center at Al-Nassirhya city. Regarding the level of education, the highest percentage (56%) were graduates of Nursing Institute. Regarding to the years of general nursing services, (44%) of the sample was from (1-5 Years) years. As years of experience in specialist heart center highest percentage, (48%) of them were with (1-3) years of experience. These results disagree with the findings of many studies which were done by **(11)(13),**who indicated that the highest percentage of years of experience were between (1-10) years. No training courses in concern to cardiac

catheterization were given to the most of the study sample (72%).The remaining (28%) had training courses, (12%) inside Iraq and (16%) outside Iraq. In fact, there is no concern from Ministry of Iraqi health in the training course inside or Outside Iraq. The findings of the study sample showed that there was no statistical significant association between nurses' age and their knowledge concerning the complications of cardiac catheterization at ( pre test, post-1 and post-2) of educational program Concerning relationship between Nurses' Knowledge with gender, level of education, training sessions and years of employment as nurses there is no statistical significant association between nurses' gender, level of education and training sessions at (post-1 and post-2), and there is no statistical significant association between nurses' years of service in nursing field and their knowledge concerning the complications of cardiac catheterization in children at (pre test, post-1 and post-2) for educational program, previous studies showed this also. The administrator of the cardiac catheterization program should maintain a curriculum of training within the catheterization laboratory. This should include regular training conferences and morbidity and mortality conferences in which all-adverse events associated with catheterization are systematically reviewed in the presence of representatives from all constituents of the congenital cardiac program **(14).**

## CONCLUSIONS

Most study sample were males, Mostly the ages of study sample were (25-29) Years, a High percentage of the sample did not participate in training courses concerning to cardiac catheterization. Highly significant differences between the two periods (pre and post-1 tests) of study sample in all domains of **(**nurses' information about cardiac catheterization and its complication in pediatric.

## RECOMMENDATIONS:

Nurses must participate in training course about cardiac catheterization inside or outside Iraq. The study recommended the necessity to develop the nurses' skills by giving chance to nurses to complete higher studies with training sessions in developed countries to improve nursing care provided to the child and his family during cardiac catheterization procedure.

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