Evaluation of Nurses' Practices in Intensive Care Units Following Coronary Artery Bypass Grafting Patients in Baghdad City

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الخلاصـــة:

الهدف: تقويم ممارسات الملاك التمريضي بعد عملية زرع الشرايين في وحدات العناية المركزة وإيجاد العلاقة مع بعض المتغيرات.

المنهجيّـــة: اختبرت عيّنة غرضية "غير احتمالية" شملت (٥٠) ممرض وممرضة من ثلاث مستشفيات لجراحة القلب في مدينة بغداد واشتملت أدوات الدراسة على جزئين رئيسين حسب المراجع المعتمدة، الجزء الأول يتضمن المعلومات الديموغرافية للعيّنة والجزء الثاني يتضمن أدوات الملاحظة (الرصد) والذي يتكون من ستة أجزاء موزّعة على (٧٨) فقرة.
حُدّدَ الثبات والصدق الداخلي لاستمارة الرصد والملاحظة من خلال تحليل دراسة استدلالية. جُمِعَت المعلومات من خلال استمارة الرصد وحللت البيانات من خلال استعمال أسلوبين للتحليل الإحصائي: الإحصاء الوصفي (التكرارات، النسبة المئوية، الانحراف المعياري، معدل الدرجات، الوسط الحسابي المرجح والكفاية النسبية)، والتحليل الاستنتاجي (معامل الارتباط واختبار مربع كاي).

النتائـــج: أظهرت نتائج الدراسة أنّ أغلب ممارسات الملاك التمريضي ضعيفة في وحدات العناية المركزة لمرضى زراعة الشرايين التاجية، ووجود علاقة ذات دلالة إحصائية بين الممارسات التمريضية والمستوى التعليمي، بينما لا توجد علاقة ذات دلالة إحصائية بين الممارسات التمريضية والعوامل الديموغرافية التي تشمل (العمر، الجنس، سنوات الخبرة في التمريض، سنوات الخبرة في العناية المركزة والدورات التدريبية).

التوصيات: استناداً إلى نتائج الدراسة، أوصى الباحث بتطوير استمارة تقييم وتسجيل الممارسات التمريضية في وحدات العناية المركزة وزيادة المستوى التعليمي للملاك التمريضي وزيادة البرامج التدريبية الخاصة في العناية المركزة وإعطاء المرضى وأسرهم إرشادات بعد العملية وتحسين مهارات الملاك التمريضي لمنع أو تقليل المضاعفات بعد عملية زرع الشرايين التاجية.

Abstract:

Objective: To evaluate nurses' practices toward coronary artery bypass grafting (CABG) patients in the intensive care units (ICU) and to find out the relationship with some variables.

Methodology: A purposive sample of (50) staff nurses was selected out of three hospitals for cardiac surgery. The study instrument consisted of two major sections was constructed. It is based on the review of literature. First it is concerned with demographic data for nurses; and the second section is observational tool (checklist) is composed of six parts in which there were (78) items. Reliability and validity of the observational checklist were determined through the analysis of a pilot study.
Data were collected through the use of the observational tool and analyzed through the use of two statistical approaches; descriptive statistical analysis (frequencies, percentage, Standards Deviation, Range of scores, mean of scores and relative sufficiency; and inferential statistical analysis (correlation coefficient and chi- square test).

Results: The findings of the study reveal that most of the nurses' practices has poor scores, in intensive care units toward coronary artery bypass grafting patients, and it was found that, there is a significant relationship between level of education and nurse's practices but no significant relationship between nurses' practices and demographic variables which include age, gender, years of experience in nursing, years of experience in ICU and training session.

Recommendations: Based on the results of the study, the researcher recommends that developing assessment sheet for skill and daily note in the ICU, the education level should be improved, special training programs should be given for the nurses working in ICU and give patients and family education post operation. Nurses' skills should be promoted to reduce or prevent complication post CABG.

Key words: Nurses' Practices, Coronary Artery Bypasses Grafting.

Introduction:

Cardiovascular diseases continue to be the leading cause of death and morbidity worldwide. It is not just a disease of the elderly; forty five percent of all heart attacks occur in people under age 65 year nor cardiovascular male disease, more than half of all deaths from cardiovascular disease occur in females [1, 2, 3, 4]. Coronary artery diseases is the most common indication for cardiac surgery when a coronary artery becomes obstructed, a coronary artery

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bypass graft may be performed.

The graft allow blood to bypass the obstructed portion of the coronary artery and provides improved blood flow and increased oxygen to the myocardial tissue distal to the lesion. Although CABG does not cure the underlying heart disease, it does reduce the incidence of angina and prevents myocardial ischemia and infarction [5, 6].

Most patients are admitted directly to the intensive care unit (ICU) from the operation room. Because the patient has multiple needs simultaneously, most critical care units have an organized system developed to facilitate smooth patient admission and rapid assessment. This system may involve two nurses working together for the first 30 to 45 minutes. Collaborative management of patient after CABG surgery is essential. Priority goal include: (1) Achievement of hemodynamic stability (2) Early extubation (3) Effective management of pain [7,8].

In Iraq, the number of performed CABG surgery is estimated (1928) patients for the period 1993-2006. (148 patients in a year, 12 patients in a month, and 3 patients in a week) [9].

Methodology:

A descriptive design was used out to evaluate nurses' practices in intensive care units toward patients post CABG surgery in Baghdad city. This study started from Dec. 20th 2005 through August 2nd 2006.

The present study aims to achieve the following objectives:

1. To evaluate nurses' practices toward coronary artery bypass grafting patients in the intensive care units.
2. To find out the relationships between nurses' practices and the demographic variables of age, gender, level of education, training session in the intensive care units, years of experience in nursing and years of experience in the intensive care units of cardiac surgery.

The study was conducted in ICUs of three cardiac surgery hospitals that are located in Baghdad City which perform CABG surgery; Ibn Al-Betar Hospital, Ibn Al-Nafees Hospital and the Iraqi Center for Heart Diseases.

A purposive "non-probability" sample of 50 nurses who worked in ICUs at three cardiac surgery hospitals and they provide nursing care for patients postoperatively CABG was selected (Table 1).

Table 1. Sample of the study in the hospitals

No.	Hospitals	Frequency	Percent
1	Ibn Al-Betar hospital	29	58
2	Iraqi center for heart diseases	11	22
3	Ibn Al-Nafees hospitals	10	20
Total		50	100

The questionnaire was constructed for the purpose of the study. The questionnaire and observation tool consisted of (85) items which include two sections.

Section I: Demographic data sheet of nurses in intensive care units.

Section II: Observation checklist

The observation checklist included 78 items of nurses' practices who work in ICUs toward patients with CABG. This section consists of six parts as follows:

Part I: checklist of instrument preparation of patient before discharge from operating room (OR), it consist of 7 items.
Part II: checklist of monitoring which divided to 9 main items.

Part III: checklist of promoting oxygen carbon dioxide exchange: it consisted (6) items.
Part VI: checklist of promoting fluid and electrolyte balance: it consisted (6) items.
Part V: checklist of promoting comfortable and rest: it consisted (8) items.
Part IV: checklist of control infection: it consist (8) items.

The validity of the instrument was established through a panel of (16) experts. These experts were asked to review the questionnaire for content clarity, relevancy and adequacy.

A pilot study was conducted on 5 staff nurses to determine the reliability (r=0.99) and the content validity of the observational tool is **(r= 0.94)**

Data were collected from February 1st to June 15th 2006 through the use of the constructed questionnaire as an observation tool; the researcher gathered the subject's responses through an application of direct observation as a means of data collection. Nurses were observed while they are working in the intensive care unit during the day and night to provide care to patients who experience coronary artery bypass grafting surgery. The observation took about (1-2) days at morning and evening shift.

Data were collected through the use of the observational tool and analyzed through the use of two statistical approaches; descriptive statistical analysis (frequencies, percentage, SD, range of scores, mean of scores and relative sufficiency) [10]; and inferential statistical analysis (correlation coefficient and chi-square test) [11].

In the chi-square; the nurses' practices were divided into three scores by:
Range of score = maximum–minimum
Range =14 =214–172
(172 – 186) Poor score
(187 – 200) Fair score
(201 – 214) Good score

Results:

Table 2. Distribution of the sample (50) according to their demographic characteristics

Variables	Frequency	Percent
1- Age (years)		
24-29	28	56
30-35	17	34
36-41	4	8
42-47	1	2
2- Gender		
Male	32	64
Female	18	36
3- Level of Education		
Nursing Secondary School graduate	5	10
Nursing Institute graduate	24	48
Nursing College graduate	21	42

Table 2. (Continued)

Variables	Frequency	Percent
4- Years of Experience in Nursing		
1-6	35	70
7-12	11	22
13-18	-	-
19-24	4	8
5- Years of Experience in ICU		
1-6	41	82
7-12	8	16
13-18	1	2
6- Training Session in ICU		
Nil	15	30
1-2	32	64
3-4	2	4
5-6	1	2

Mean of age = 30 year.

This table shows that the distribution of age indicated that the majority of nurses' ages were (24-29) years old who were accounted for (56%). Most of them were male (64%).

The level of education represents that most of them were from nursing institute (48%), and table shows that the years of experience from (1-6) years in nursing (70%) and (82%) in ICU, finally most of nurses had (64%) of (1-2) training sessions in intensive care unit.

Table 3. Mean of scores and relative sufficiency of nurses' practices concerning preparation of patient before discharging from operation room toward CABG (Part I)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Prepare monitor setting	46	92	3	6	1	2	2.9	96.66	H
2.	Connect ventilator with oxygen center and air center	47	94	3	6	-	-	2.94	98	H
3.	Prepare ventilator setting	5	10	16	32	29	58	1.52	50.66	O.C
4.	Prepare cables of arterial line	46	29	4	8	-	-	2.92	97.33	H
5.	Prepare cables of central venous line	43	86	7	14	-	-	2.82	95.33	H
6.	Prepare bed and sheet	38	79	12	24	-	-	2.76	92	H
7.	Prepare suction machine for chest drains	40	80	10	20	-	-	2.8	93.33	H

F=frequency, H= high, MS=mean of scores, O.C=out of comparison, RS=relative sufficiency, %= percent

The findings of this table indicated that the evaluation of relative sufficiency was highly on items (1, 2, 4, 5, 6, 7) and one item (3) was out of comparison.

Table 4. Mean of scores and relative sufficiency of nurses' practices concerning monitoring of cardiovascular status toward CABG (part II-A-)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Check blood pressure	48	96	2	4	-	-	2.96	98.66	H
2.	Record Blood pressure hourly	41	82	9	18	-	-	2.82	94	H
3.	Record pulse [rate, pulse deficit every 15 min. until it be stable]	44	88	6	12	-	-	2.88	96	H
4.	Check cardiac output hourly by stroke volume and heart beats	-	-	14	28	36	72	1.28	42.66	O.C
5.	Check central venous pressure (CVP) hourly	45	90	5	10	-	-	2.9	96.66	H
6.	Record Electrocardiography for signs of any abnormalities (dysrhythmias, S-T segment, Ventricle Fibrillation, Atrial Fibrillation)	28	56	21	42	1	2	2.54	84.66	M
7.	Check body temperature	37	74	12	24	1	2	2.72	90.66	H
8.	Record body temperature hourly	35	70	15	30	-	-	2.7	90	H
9.	Check skin color	-	-	7	14	43	86	1.1	38	O.C
10.	Check central venous line [transducer setup]	39	78	10	20	1	2	2.76	92	H
11.	Check signs of hypovolemia (decrease CVP, decrease cardiac output)	30	60	20	40	-	-	2.6	86.66	M
12.	Check arterial lines (transducer setup).	42	84	8	16	-	-	2.84	94.66	H
13.	Check signs of cardiac tamponade (cessation of chest drainage, restlessness, decrease blood pressure, increased CVP, increased PAP and LAP)	-	-	7	14	43	86	1.14	38	O.C
14.	Auscultate heart sound for quality, extra sounds, murmurs	-	-	-	-	50	100	1	33.33	O.C
15.	Record chest tube out put hourly	45	90	5	10	-	-	2.9	96.66	H
16.	Check any oozing or bleeding from incision of operation	34	68	16	32	-	-	2.68	89.33	H

F=frequency, H= high, MS= mean of scores, O.C=out of comparison, RS=relative sufficiency, %= percent

This table presented that the evaluation of relative sufficiency is highly on items (1, 2, 3, 5, 7, 8, 10, 12, 15, 16), and moderate on items (6, 11), and the remaining items are out of comparison.

Table 5. Mean of scores and relative sufficiency of nurses' practices concerning monitoring of respiratory status toward CABG (Part II-B-)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Assess respirations: rate, depth if the ventilator don't control	42	84	8	16	-	-	2.84	94.66	H
2.	Check breath sounds	-	-	-	-	50	100	1	33.33	O.C
3.	Check that endotracheal tube [ET] is connected to the ventilator. ET patency and position	34	68	15	30	1	2	2.66	88.66	M
4.	Recording ventilator reading hourly [tidal volume, frequency of breathing/ min]	40	80	10	20	-	-	2.8	93.33	H
5.	Record arterial blood gases hourly.	44	88	6	12	-	-	2.88	96	H
6.	check weaning process while intubation.	35	70	15	30	-	-	2.7	90	H

F=frequency, H=high, MS=mean of scores, O.C=out of comparison, RS=relative sufficiency, %= percent

This table reported that the evaluation of relative sufficiency was high on items (1, 4, 5, 6); and moderate on item (3); and was out of comparison for the remaining items.

Table 6. Mean of scores and relative sufficiency of nurses' practices concerning monitoring of neurological status toward CABG (Part II-C-)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Check level of consciousness hourly	33	66	16	32	1	2	2.64	88	M
2.	Check papillary size and reaction to light hourly	-	-	-	-	50	100	1	33.33	O.C
3.	Check orientation level hourly	27	54	22	44	1	2	2.52	84	M
4.	Check sensation and movement of extremities hourly	-	-	7	14	43	86	1.14	38	O.C
5.	Check any sign of seizures	28	56	21	42	1	2	2.54	84.66	M
6.	Record any abnormal signs and symptoms.	34	68	16	32	-	-	2.68	89.33	H

F= frequency, H=high, MS=mean of scores, O.C=out of comparison, RS=relative sufficiency, %= percent

The result of this table presented that the relative sufficiency was high on item (6); and moderate on item (1, 3, 5); and out of comparison on items (2, 4).

Table 7. Mean of scores and relative sufficiency of nurses' practices concerning monitoring of gastrointestinal status toward CABG (Part II-D-)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Record the sings of nausea and vomiting	30	60	20	40	-	-	2.6	86.66	M
2.	Auscultation bowel sound	-	-	-	-	50	100	1	33.33	O.C

F=frequency, M=moderate, MS=mean of scores, O.C=out of comparison, RS=relative sufficiency, %=percent

The relative sufficiency in this table is moderate on item (1), and out of comparison on item (2).

Table 8. Mean of scores and relative sufficiency of nurses' practices concerning monitoring of urinary system toward CABG (Part II-E-)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Record urine out put amount hourly	46	92	4	8	-	-	2.92	97.33	H
2.	Check the urine color and any signs of renal insufficiency	37	74	13	26	-	-	2.74	91.33	H
3.	Monitor laboratory results	33	66	16	32	1	2	2.64	88	M
4.	Report laboratory results	36	72	14	28	-	-	2.72	90.66	H
5.	Record any abnormal signs and symptoms.	32	64	18	36	-	-	2.64	88	M

F=frequency, H= high, M=moderate, MS=mean of scores, RS=relative sufficiency, %= percent

The result of this table presents that the relative sufficiency is high on items (1, 2, 4); and moderate on items (3, 5).

Table 9. Mean of scores and relative sufficiency of nurses' practices concerning monitoring of fluid and electrolyte balance toward CABG (Part II-F-)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Check intake and output flow sheets hourly	44	88	6	12	-	-	2.88	96	H
2.	Record intake and output hourly.	42	84	8	16	-	-	2.84	94.66	H
3.	Check serum potassium, calcium and sodium levels hourly	38	76	12	24	-	-	2.76	92	H
4.	Record signs of edema	20	40	23	46	7	14	2.26	75.33	L
5.	Check any changes in serum electrolyte	33	66	17	34	-	-	2.66	88.66	M

F=frequency, H= high, L=low, M=moderate, MS=mean of scores, RS=relative sufficiency, %= percent

This table indicates that the relative sufficiency is high on items (1, 2, 3); and low on item (4); and moderate on item (5).

Table 10. Mean of scores and relative sufficiency of nurses' practices concerning promoting oxygen/carbon dioxide exchange toward CABG (Part III)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1-	Suction during intubation	47	94	3	6	-	-	2.94	98	H
2-	Suction as necessary after extubation	35	70	15	30	-	-	2.7	90	H
3-	Elevated the head of patients slightly and turn side to side	35	70	15	30	-	-	2.7	90	H
4-	Encourage breathing exercise.	2	4	5	10	43	86	1.18	39.33	O.C
5-	Give analgesics before breathing and coughing exercise as order	24	48	25	50	1	2	2.46	82	M
6-	Encourage patient for coughing	25	50	24	48	1	2	2.48	82.66	M

F=frequency, H=high, M=moderate, MS=mean of scores, O.C=out of comparison, RS=relative sufficiency, %= percent

Table (10) presents that the high evaluation of relative sufficiency is high on items (1, 2, 3) and moderate for item (5, 6), the remaining items is out of comparison.

Table 11. Mean of scores and relative sufficiency of nurses' practices concerning promoting fluids and electrolytes balance toward CABG (Part IV)

List	Items	Always		Sometimes		Never		MS	RS	Evaluation
		F	%	F	%	F	%			
1.	Give maintenance fluid as prescribed	48	96	2	4	-	-	2.96	98.66	H
2.	Give maintenance intravenous fluid as prescribed	41	82	9	18	-	-	2.82	94.	H
3.	Give supplemental potassium chloride as prescribed	45	90	5	10	-	-	2.9	96.66	H
4.	Give calcium glyconate as order.	45	90	5	10	-	-	2.9	96.66	H
5.	Give blood product as required	40	80	10	20	-	-	2.8	93.33	H
6.	Give blood as required	46	92	4	8	-	-	2.92	97.33	H

F=frequency, H=high, MS=mean of scores, RS=relative sufficiency, %= percent

This table reveals that the evaluation of RS is high on all items.

Discussion:

Part I: Discussion of the nurses' demographic characteristics distribution:

Through the distribution of demographic variables, the present study revealed that the age range is between (24–47) years and the age for the majority of participants is (24–29) years which accounts for (56%), the mean of the age is (30 years) and standard deviation was (4.35). Most of the sample is male (64%), and graduate from nursing institute (48%).

In addition to there years of experience in nursing, the study indicated that most of them (70%) has (1-6) years of experience in nursing and (1-6) years in the intensive care unit who accounts (82%).

Concerning training session in the intensive care units, the results revealed that high percentage (64%) of the nurses has (1-2) training session (Table 2).

A study was agreed with the present study where it revealed that the highest percentage (48%) of nurses is of (24–29) years old. In the present study, the highest percentage (54%) of nurses is male, and (90%) is Nursing College graduates and the highest percentage (86%) has (0-6) years of experience in the nursing and highest percentage (88%) has (0-6) years of experience in the intensive care unit [12].

Part II: Discussion of Evaluation of nurses' practices toward CABG Surgery in ICU:

2.1. Evaluation of nurses' practices for preparation of patients before discharging from operation room post CABG:

Data analysis had indicated that the degree to which nurses' practices had been reported and manifested out of the mean of scores and relative sufficiency of these items.

The study showed that the high relative sufficiency in six items are related to "prepare monitor setting", "connect ventilator with oxygen center and air center", "prepare cables of arterial line", "prepare cables of central venous line", "prepare bed and sheet" and, "prepare suction machine for chest drains" (Table 3).

The out of comparison for the item "preparing ventilator setting" reflects that most of nurses do not have training session in preparing ventilator setting.

Most of the sample has high practice in preparation, because most of preparations depend on machine in ICUs and not need special skills.

A study was agreed with the result of the study concerning preparing monitor, preparing ventilator, preparing cables of arterial and central venous line and preparing suction machine [13].

2-2. Evaluation of nurses' practices concerning monitoring of cardiovascular status post CABG:

The study presented that the high relative sufficiency of nurses' practices for ten items concerning "check blood pressure", "record blood pressure hourly", "record pulse (rate, pulse deficit every 15 minutes until it be stable)", "check central venous pressure hourly", "check body temperature", "record body temperature hourly", "check central venous line (transducer setup)", "check arterial lines (transducer setup)", "record chest tube output hourly" and "check any oozing or bleeding from incision of operation", nurses had good practices in this part. The moderate relative sufficiency in the two items of "record electrocardiography for signs of any abnormalities (dysrhythmias, ST, VF, AF)" and "check signs of hypovolemia (decrease CVP, decrease cardiac output", in these items, nurses need high practices and they must continuously monitor all hemodynamic parameters, document HR, BP, CVP, PAP, every 15 minutes until stable and controlled dysrhythmias (Table 4) [14].

The relative sufficiency was out of comparison for four items "check cardiac output hourly by stroke volume and heart beat", "check skin color", "check signs of cardiac tamponade (cessation of chest drainage restlessness, decrease blood pressure, increased CVP, increased PAP and LAP", and "auscultation heart sound for quality, extra sounds, murmurs", in these items, nurses had inadequate practices in the intensive care units.

This result is consistent with a study which revealed that nurses have inadequate practices in ICU for items of "check cardiac output hourly", "check skin color", and "check central venous pressure CVP hourly" [12].

2-3. Evaluation of nurses' practices concerning monitoring of respiration post CABG:

The results had presented high relative sufficiency of nurses' practices of "assess respiration rate, depth if the ventilator don't control", "recording ventilator reading hourly (tidal volume, frequency of breathing/ min)", "record arterial blood gases hourly" and "check weaning process while intubation".

It was stated that the nurses should monitor respiratory parameters (rate, depth) and monitor mechanical ventilation (tidal volume, frequency of breathing/min) until respiratory parameters are acceptable and check ventilator weaning protocol [14].

The relative sufficiency was moderate for the items "check that endotracheal tube (ET) is connected to the ventilator. ET patency and position" and, it was out of comparison for one item "check breath sound". These results showed that nurses have malpractices in these items, because nurses do not have the same level of education and practices (Table 5).

The present study disagreed with a study that revealed high MS of the item of checking breath sound and endotracheal tube [12].

2.4. Nurses' practices concerning monitoring of neurologic status post CABG:

The study presented highly relative sufficiency in one item "record any abnormal signs and symptoms" which means that that nurses record any abnormality in the neurologic status". The relative sufficiency was moderate in three items "check level of consciousness hourly", "check orientation level hourly" and "check any sign of seizures".

The relative sufficiency was out of comparison for nurses' practices in two items "check papillary size and reaction to light hourly", and "check sensation and movement of extremities hourly" which reflects inadequate nurses' practices relative to neurologic status post CABG. So, this may lead to many complications in ICU (Table 6).

The nurse must check papillary response, spontaneous, purposeful movement of all extremities and observe restlessness and disorientation [14].

It was stated that cerebrovascular accident currently occur in approximately (1% to 2%) of the patients after myocardial revascularization, and the neurologic events after surgery rose in each decade of like after the age of 40 years (0.6%), but especially over the age of 70 years (34%) and again over the age of 80 years (41%) [15].

2.5. Nurses' practices concerning monitoring of gastrointestinal toward CABG:

The study results revealed that there are two items "record the signs of nausea and vomiting" which evaluate moderate relative sufficiency and other item of "auscultation bowel sound" were out of comparison. The study results presented that nurses do not possess adequate knowledge about auscultation of bowel sounds and recording signs of nausea and vomiting. In the summary, nurses' practices were inadequate which lead to some problems like constipation and vomiting which lead to complication (Table 7).

It was stated the nurse must assess bowel sounds to prevent complications resulting from long period of anesthesia [16].

2.6. Evaluation of nurses' practices concerning monitoring of urinary status post CABG:

The study results revealed that the relative sufficiency was high in three items of "record urine output amount hourly", "check the urine color and any signs of renal insufficiency" and "report the laboratory results" which reflects good nurses' practices and moderate relative sufficiency in the two items of "monitor laboratory results" and "record any abnormal signs and symptoms" (Table 8).

The study results had stated that high mean of score for the items related to measuring the intake and output hourly, and observing urine output amounts, color, PH, specific gravity (for signs of renal insufficiency), this result is in agreement with a study [12].

2.7. Evaluation of nurses' practices concerning monitoring of fluids and electrolytes balance post CABG:

The study results presented high relative sufficiency in three items of "check intake and output flow sheets hourly", "record intake and output hourly", and "check serum potassium, calcium and sodium levels hourly" and one item is low relative sufficiency of "record signs of edema" and the moderate item is "check any changes in serum electrolyte" (Table 9). This result reflected malpractice in two items of fluids and electrolytes balance. This result disagrees with a study which revealed that high mean of scores for items of recording signs of edema and checking any changes in serum electrolytes and agrees with other items stated in this part [12]. It was stated that the nurse monitors urine output 1 hour/24 hours, then shift while in ICU, monitor for signs and symptoms of hypovolemia and check serum electrolyte [17].

2.8. Evaluation of nurses' practices concerning promoting oxygen/carbon dioxide exchange post CABG:

It was revealed that the relative sufficiency was high for items of "suction during intubation", "suction as necessary after extubation" and "elevating the head of patients slightly and turn side to side", which reflects good nurses' practices.

The relative sufficiency was moderate for the items of "give analgesics before breathing and coughing exercise as order" and "encourage patient for coughing", the relative sufficiency was out of comparison for the item of "encourage breathing exercise". This result reflected poor nurses' practices which lead to problems in the oxygen/carbon dioxide exchange such as hypoxia (Table 10).

This result is agreed with a study which showed high mean of score for the items of "suction during intubation", "suction as necessary after extubation and elevating the head of patient slightly" and "turn side to side" and disagreed with the result of the high mean score for the item of "encourage breathing exercise" [12].

It was stated that there were three benefits from protocol-based weaning for any study outcome that includes patients are successfully weaned from mechanical ventilation, duration of mechanical ventilation, and length of stay. Also, the nurse promotes aggressive pulmonary hygiene every 1 to 2 hours while the patient is wake [18].

2.9. Evaluation of nurses' practices for promoting fluid and electrolyte balance toward CABG:

All items of nurses' practices (Table 11) are of good practice toward promoting fluids and electrolytess balance. This result agreed with a study which stated that the nurse maintains the fluids and electrolytes balance always [12].

It was stated that the nurse gave intravascular fluid volume is maintained by using blood according to the level of the patient's haemoglobin. Crystalloid infusion is generally kept to a maintenance level to avoid further extravascular fluid loading. Blood is given to maintain blood pressure and urine output as required. Sodium and potassium levels are monitored regularly and potassium is given via central venous access to maintain a level of greater than 4.5 mmol/ 1 [19].

2.10. Evaluation of nurses' practices concerning promoting comfortable and rest post CABG:

The results revealed (Table 12) that the relative sufficiency is high for the items of "change bed lines when patient needed" and "put the patient in the semi-fowler position". This reflected good practice for nurses in ICU. The relative sufficiency was moderate for the items of "give the narcotic analgesic every 3 hours during the first hours, "provide quiet and warm environment", and "encourage patient to incision support during coughing". The relative sufficiency was low for the item of "give frequent mouth care". So, this reflects poor nurses' practices. The relative sufficiency was out of comparison for items of "encourage patient to share feelings and expression" and "apply plan activities to permit period of sleep".

The results presented in (Table 12) indicated an inadequate nurses' practices, because the nurse does not give important role for patient's rest and comfort which causes many health problems for patients.

This result is agreed with a study which stated that the nurses' working gives high mean of score for items of "change bed lines", "encourage patient to share feelings" and "apply plan for activity and sleep of patient" and poor practices for items of "give analgesic for patient", "mouth care" and "provide warm environment" [12].

It was showed that nurses provide post CABG pain management which is critical in the postoperative period, and patients are kept as comfortable as possible. In addition to patients' comfort, pain management reduces stress on the heart, decreases the need for oxygen, and promotes healing. Other comfort measures are routinely used such as positioning, controlling environmental temperature, frequent oral hygiene, and control on the patients' sleep and activities [20].

2.11. Evaluation of nurses' practices for promoting measures concerning control of infection post CABG:

The study results showed that the relative sufficiency was high for six items of "assess the sternal wound", "record any signs of infection", "maintain a sterile dressing for the first 48 hours after surgery", "give antibiotic in the appropriate time", "obtain a culture of wound drainage as order" and "change dressing of wound as order" (Table 13). These results reflect good nurses' practices which lead to reduce danger of infection post CABG. The relative sufficiency was out of comparison for two items of "apply aseptic technique while removing chest drainage tube" and "using sterile technique when performing wound care".

The poor practices of nurses in applying aseptic technique could be attributed to their knowledge and health agency routine which applied in the hospitals that lead to an increased risk of infection post CABG.

It was showed that the nurse should give broad-spectrum antibiotic for 2 to 4 days. Although any initial postoperative fever is likely to be pulmonary in origin, the nurse assess the patient's skin and all incisions for evidence of infection. Incision care is provided based on the hospital's protocol and sterile technique should be utilized when performing wound care to the incision sites [21].

Part III. Discussion of association between the nurses' practices and some variables:

3-1 **Association between nurses' practices and level of education**:

The study result showed that there is a significant relationship between level of education and nurses' practices scores. The study revealed the high percentage (32%) is nursing institute graduated in poor scores (Table 14). Intensive care units need educated nurses who graduated from Bachelor program and above, consequently, this affects their performance. This result disagrees with a study which showed that there is no relationship between nurses' practices and level of education [12].

Recommendations:

Based on the results of the study, the following recommendations are made:

1. Establishing new standard checklist that will be suitable for intensive care nurses in Iraq depending on standard checklist of foreign and Arabic countries and upon the results of this thesis.
2. Developing an assessment sheet for skills and daily notes in the intensive care units.
3. Special training programs should be designed and constructed for nurses in this area to reinforce their skills and promote their experiences.
4. Nurse in intensive care units must take the opportunity for continuing their education to maintain their knowledge and skills, as well as to be updated in cardiaosurgical nursing.
5. Nurses in ICU must take care in some points of work toward CABG patients such as checking cardiac output and cardiac tamponade, breath sounds, checking papillary site and reaction to light hourly, auscultation of heart sound for quality, murmurs, auscultation of bowel sounds, applying plan activities to permit period of sleep, and patients' stress. Also, they must apply aseptic technique when removing chest drainage tube and using sterile technique when performing wound care.
6. Give post CABG education for patients and their families to reduce discomforts and complications.

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