Nurses Practices toward Renal Dysfunction Post-Operative Open Heart Surgery: A descriptive Study

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ABSTRACT

Acute kidney injury (AKI) complicates up to 30% of patients' recovery following cardiac surgery, increases a patient's chance of dying five times during hospitalization and damages and impairments the brain, lungs, and stomach. AKI is characterized by renal ischemia, reperfusion, inflammation, hemolysis, oxidative stress, cholesterol emboli, and toxins. This study aims to evaluate nurse's practices toward Renal Dysfunction post-operative Open heart surgery. A quantitative (descriptive study) design used in the current study, non-probability (purposive) sample of 30 nurses participated from intensive care unit, for the timeframe 26th of December, 2022 to the 2nd of April, 2023 at Al-Nasiriya Heart Center. The data was analyzed using descriptive statistics and SPSS. The findings of study group indicated that nursing staff are showing poor to fair level of practices (poor = 46.7% and fair = 53.3%) regarding renal dysfunction after open heart surgery.The researchers recommend that special training sessions about renal dysfunction and its complications following cardiac surgery, booklet should be designed and distributed to all nurses who working in the ICU, and an educational program must be implemented to improve nurse's practices

Keywords: Practices, Renal Dysfunction, Post-Operative, Open Heart Surgery

INTRODUCTION

Acute renal injury following open heart surgery is a known complication that is related with greater morbidity and mortality. In its most severe form, it lengthens hospital and intensive care unit stays, raises medical costs, and increases the chances ratio of surgical mortality by a factor of three to eight [1]. Acute Kidney Injury is estimated to cause the deaths of 1.7 million individuals annually throughout the world [2].After cardiac surgery, AKI that necessitates kidney replacement therapy is linked to an elevated 28-day death rate of 15% to 85%, based on comorbidities that are both acute and chronic, age affects both the incidence and prevalence of end stage renal disease, which peaks at an average age of 60 to 64 years in the eighth decae [3,4].To optimize the postoperative therapy operation and successfully manage of CSA-AKI, an accurate prediction algorithm for detecting high-risk patients is needed [5].An important technique for enhancing the management of such patients during the intraoperative and postoperative phases is the early identification of patients at risk of developing AKI after cardiac surgery [6].

MATERIALS AND METHODS

A quantitative (descriptive study) design Study was carried out for the timeframe 26th of December, 2022 to the 2nd of April, 2023. The study was conducted at the intensive care unit of AL-Nasiriyah Heart Center. Non-probability (purposive) sample was used. The study subject consists of (30) nurses working in AL-Nasiriyah Heart Center in AL-Nasiriya city were selected. A questionnaire was designed to measure the variable consists of part (1) socio-demographic characteristics from nurses using an interview questionnaire sheet, which contains (7) items such as gender, age, level of education, marital status, years of experience, years of experience in ICU and training course, part (2) included observation checklist was comprised of (12) items toward renal dysfunction post-operative open heart surgery. Content validity for early develops instruments is determined through a panel of (15) experts with more than 5 years in their specialties to examine the contents of study tools. the reliability of study tools was (0.794) which means that the questionnaires had an adequate level, the data were analysed and interpreted through use of the application of the statistical package for social science (SPSS), version 26.0.

RESULTS

Table 1

Distribution of Nurses by their Socio-Demographic data. N= 30

No.	Characteristics		Study sample	
			F	**%**
1	**Gender**	Male	11	36.7
		Female	19	63.3
		Total	*30*	*100*
2	**Age (year)**	Less than 28	15	50
		28 – less than 33	11	36.7
		33 – less than 38	3	10
		38 or more	1	3.3
		Total	*30*	*100*
		Mean ± SD	*28.27 ± 4*	
3	**Marital status**	Married	15	50
		Unmarried	13	43.3
		Divorced	0	0
		Widowed/er	0	0
		Separated	2	6.7
		Total	*30*	*100*
4	**Level of education in nursing**	High school	2	6.7
		Diploma	9	30
		Bachelor	18	60
		Postgraduate	1	3.3
		Total	*30*	*100*

No: Number, f: Frequency, %: Percentage, sd.: Standard deviation

The descriptive analysis in table (1) shows that 63.3% of nursing staff in the study sample are females while remaining were males. The average age for nursing staff is 28.27±4 years and the highest percentage refers to age group of "less than 28 year" among 50% of them. The marital status shows that nursing staff are "married" as reported by the highest percentages among 50% , regarding level of education in nursing, the highest percentages refer to bachelor degree in nursing as reported among 60% of nursing staff in the study sample.

Table 2

Distribution of Nursing Staff according to their Professional Characteristics

No.	Characteristics	Study sample	
		F	**%**

1	**Years of Experience**	1 – less than 6	18	60
		6 – less than 11	7	23.3
		11 – less than 16	5	16.7
		Total	*30*	*100*
		Mean ± SD	*6.07 ± 3.7*	
2	**Years of ICU Experience**	1 – less than 6	22	73.3
		6 – less than 11	6	20
		11 and more	2	6.7
		Total	*30*	*100*
		Mean ± SD	*4.60 ± 3.15*	
3	**Participate in training course**	No	14	46.7
		Yes	16	53.3
		Total	*30*	*100*
4	**No. of courses inside country**	None	14	46.7
		1 – less than 6	7	23.3
		6 – less than 11	6	23.3
		11 and more	2	6.7
		Total	*30*	*100*
5	**No of courses outside country**	None	30	100
		1	0	0
		Total	*30*	*100*

No: Number, f: Frequency, %: Percentage, SD: Standard deviation

The average years of experience in nursing for nursing staff is 6.07 ± 3.7 in which 60% of them seen with group of "1- less than 6 years" of services. Regarding years of experience in ICU, more of nursing staff are seen with "1-less than 6" years of experience (73.3%); the average years of experience refers to 4.60 ± 3.15 years. More than half of nursing staff reported they participated in training courses as seem among 53.3%. The highest percentages regarding number of courses refer to "1-less than 6" inside country as reported among 23.3%. No one of nursing staff is participated in training courses outside country.

Table 3

Assessment of Nursing Staff's practices related to excess fluid volume

List	Practices	Application (Observation)	Study sample (N=30)		
			f(%)	M	Ass.
1	Record intake and output accurately	Never	5(16.7)	1.17	Fair
		One	16(53.3)		
		Two	8(26.7)		
		Three	1(3.3)		
2	Weigh daily at the same time of day	Never	20(66.7)	.53	Poor
		One	6(20)		
		Two	2(6.7)		
		Three	2(6.7)		
3	Monitor vital signs: blood	Never	1(3.3)	1.90	Fair

	pressure rhythm pulse rate, respiratory rate	**One**	8(26.7)		
		Two	14(46.7)		
		Three	7(23.3)		
4	Limit fluid intake to prescribed volume	**Never**	7(23.3)	1.33	Fair
		One	10(33.3)		
		Two	9(30)		
		Three	4(13.3)		
	Total			*1.23*	*Fair*

(Ass: Assessment, M: Mean, (Poor= 0-0.33, Fair= 0.34-0.67, Good= 0.68-1%).

The table (3) presents the items of nursing staff's practices related to "access fluid volume"; the nursing staff show fair level of practices (mean= 1.23)

Table 4

Assessment of Nursing Staff's Practices related to Hyperkalemia

L i s t	Practices	Application (Observation)	Study sample (N=30)		
			f(%)	**M**	**Ass.**
1	Monitor serum potassium level and notify if level greater than 5.5mEq/L	**Never**	3(10)	1.43	Fair
		One	15(50)		
		Two	8(26.7)		
		Three	4(26.7)		
2	Obtain ECG and observe signs of dysrhythmia	**Never**	1(3.3)	1.57	Fair
		One	13(43.3)		
		Two	14(46.7)		
		Three	2(6.7)		
3	Administer diuretics Iv glucose and polystyrene sulfate, as prescribed	**Never**	6(20)	.93	Poor
		One	21(70)		
		Two	2(6.7)		
		Three	1(3.3)		
4	Assess patient for muscle weakness and diarrhea	**Never**	9(30)	1.00	Poor
		One	13(43.4)		
		Two	7(23.3)		
		Three	1(3.3)		
	Total			*1.23*	*Fair*

Ass: Assessment, M: Mean, (Poor= 0 – 1, Fair= 1.1-2, Good= 2.1 -3)

The table (4) presents the items of nursing staff's practices related to "hyperkalemia"; the nursing staff show fair level of practices (mean= 1.23)

Table 5

Assessment of Nursing Staff's Practices related to Anemia and Metabolic Acidosis

L i s t	Practices	Application (Observation)	Study sample (N=30)		
			f (%)	**M**	**Ass.**

				M	Ass
1	Monitor RBC count, HB, Hct , PH	Never	2(6.7)	1.80	Fair
		One	9(30)		
		Two	12(40)		
		Three	7(23.3)		
2	Administer blood component therapy and Na HCO3 as indicated	Never	6(20)	1.50	Fair
		One	10(33.4)		
		Two	7(23.3)		
		Three	7(23.3)		
3	Iv fluid	Never	4(13.3)	1.70	Fair
		One	8(26.7)		
		Two	11(36.7)		
		Three	7(23.3)		
4	Laboratory value(BUN, Serum electrolyte , serum creatinine, protein)	Never	8(26.7)	1.37	Fair
		One	9(30)		
		Two	7(23.3)		
		Three	6(20)		
Total				*1.59*	*Fair*

Ass: Assessment, M: Mean, (Poor= 0 – 1, Fair= 1.1-2, Good= 2.1 -3)

Table (5) presents the items of nursing staff's practices related to "anemia and metabolic acidosis"; the nursing staff shows a fair level of practices (mean= 1.59)

DISCUSSION

Table (1) in the study reveals that 63% of the study sample were female, 50% refers to the high percentage to the age group of less than 28 years among them. Half of the nurses who participated in the study reported as married, regarding the level of education, 60% of participants with were bachelor's degrees in nursing. This results approximately similar to study at critical care unit in Baghdad city, which revealed most of the study sample (62%) were female and the age group (20-29), also there was study conducted at Al-Nassiriyah Heart Center stated 51.4% represent the percentage related to educational level from nursing college in the study sample [7,8,9].

Table (2) reveals 60% of nurses seen with group of 1-less than 6 years of experience, average years of experience 6.07 ± 3.7, as well as 73% of nurses within 1-less 6 years of experience in ICU, average years of experience 4.60 ± 3.15. More than half of nurses participated, in training courses, 1-less 6 inside country, no one of nurses participated in training courses outside country. This finding consist with descriptive study in Al-Diwaniyah Teaching Hospital, which show that the most of participants have services (1-5 years). Another study done at Qalat Salih General Hospital agree with the result of the study, which show

23.3% not sharing in training courses in nursing [10,11, 12].

The study revealed that the nurses' practices toward Renal Dysfunction Post-Operative Open Heart Surgery showing poor to fair level (Poor= 46.7% and Fair= 53.3%, Mean ± SD =16.23± 4.717) as shown in Table (3,4,5). This result is consist with descriptive study to assess nurses practices at hemodialysis unit at Baghdad teaching hospital, the result of study shows that there was deficit in the nurses practices that should apply, another study was quasi-experimental design stated that the practices score of nursing staff was inadequate for both group [13,14,15].

CONCLUSIONS

The study concludes that the nurses who work in the intensive care unit have a lack of proper practices toward renal dysfunction post-operative open heart surgery

RECOMMENDATIONS

The study recommended Continuous educational programs and updating nurses' practices through frequent attending seminars, training courses, and conferences about Renal Dysfunction after Open Heart Surgery and booklet should be designed for all ICU nursing staff.

LIST OF REFERENCES

1. Ortega-Loubon C, Fernández-Molina M, Carrascal-Hinojal Y, & Fulquet-Carreras E. Cardiac surgery-associated acute kidney injury. Annals of cardiac anaesthesia. 2016 19(4): 687–698. https://doi.org/10.4103/0971-9784.191578

2. Thongprayoon C, Hansrivijit P, Kovvuru K, Kanduri SR, Torres-Ortiz A, Acharya P, Gonzalez-Suarez ML, Kaewput W, Bathini T, & Cheungpasitporn W. Diagnostics, Risk Factors, Treatment and Outcomes of Acute Kidney Injury in a New Paradigm. Journal of Clinical Medicine, 2020. 9(4):1104. https://doi.org/10.3390/jcm9041104

3. Ostermann M, Lumlertgul N, & Wilson FP. Predective Models for Acute Kidney Injury Following Cardiac Surgery. JAMA-Journal of The American Medical Association 2022. 327(10): 927-929. doi:10.1001/jama.2022.1823

4. Atiyah HH. Assessment of Contributing Factors of End-Stage Renal Failure for Adult Patients.Kufa Journal For Nursing Science.2013 Apr 3(1).

5. Tseng PY, Chen YT, Wang CH, Chiu KM, Peng YS, Hsu SP, Chen K L, Yang CY, & Lee OK. Prediction of the development of acute kidney injury following cardiac surgery by machine learning. Critical care 2022. 24(1): 478. Retrived from https://doi.org/10.1186/s13054-020-03179-9

6. Ramos KA, Dias CB. Acute Kidney Injury after Cardiac Surgery in Patients Without Chronic Kidney Disease. Brazilian Journal of Cardiovascular Surgery. 2018. 33(5):454-461.

7. Hattab AAW, Kadhim AA, Abdulwahhab MM. Impact of Years' Experience upon Nurses' Knowledge and Practice concerning infection control at critical care units in Baghdad city. Indian Journal of Forensic Medicine and Toxicity 2020.15(1).

8. Abbas DR, & Jasim AH. Effectiveness of an Education Program on Nurses Knowledge toward Prevention of Complications Related to Valvular Replacement Surgery at Surgical Department in Al-Nasiriyah Heart Center. Indian Journal of Public Health Research and Development. 2019 Juan 10(1):802.

9. Baiez YK, & Mohammed WK. Evaluation of Nursing Staff Performance in Cardiac Care Unit at Teaching and Non-Teaching Hospitals in Kirkuk City: A Comparative Study. Iraqi National Journal of Nursing Specialities.2015 28(1).

10. Audah HR, & Hassan HH. Evaluation of Nursing Staffs' Practices about Aseptic Technique in Operation Room. Mosul Journal of Nursing 2022. 10(3): 56-62 http://dx.doi.org/10.33899/mjn.2022.175394.

11. Nasser AAA, & Hassan HH. Effectiveness of Nursing Educational Program Upon the Nurses Practices Concerning Electrocardiographic Procedural Errors in Missan Governorate. Journal of Kufa for Nursing Science, 2014.4(1).

12. Abass AH, & Atiyah HH. Effectiveness of an Educational Program on Nurses' Practices toward Using of Personal Protective Equipment at Kidney Transplant Center in Baghdad City. Indian Journal of Forensic Medicine & Toxicology.2021 Apr-Jun 15(2):1415.

13. Bakey JS. Evaluation of Nurses' Practices throughout Hemodialysis Treatment for Patients in hemodialysis unit at Baghdad teaching hospitals. Kufa Journal for Nursing Science. 2014. 2(2): 23-38.

14. Selman FK, & Sabbah A. Effectiveness of an Educational Program on nurses' practices concerning nursing interventions for patients with coronary artery disease in Al-Nasiriyah Heart Center. Indian Journal of Public Health Research and Developments. 2018. 9(8) http://dx.doi.org/10.5958/0976-5506.2018.00904.X.

15. Kadhim AJ, Abed RI, Hattab WA. Effect of Training sessions Oniraqi Nurses' Practice Concerning Patients In Phase Post-Anesthesia Care At Ghazi Al-Hariri Surgical Specialities Hospital. Nveo-Natural Volatiles & Essential Oils Journal| Nveo. 2021 Nov 30:9396-403.