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Nurses' Performance Regarding Fluids and Electrolytes Management for the Patient Undergoing Cardiac Surgeries

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ABSTRACT

Background: Nurses' performance in managing fluids and electrolytes for patients undergoing cardiac surgeries includes monitoring fluid balance, assessing electrolyte levels, administering necessary replacements, and identifying early signs of imbalances. Proper documentation and collaboration with the healthcare team further enhance patient safety and recovery. **Aim:** This study aimed to assess nurses' performance regarding fluids and electrolyte management for the patient undergoing cardiac surgeries. **Design:** A descriptive exploratory research design was used in this study. **Setting:** The study was conducted at the National Heart Institute's cardiac surgery center affiliated with the Ministry of Health, Egypt. **Sample**: A convenient sample of all available nurses caring for the patients who are undergoing cardiac surgeries in the previously mentioned setting included in the cardiac study of about 60 nurses. **Tools:** The first tool, self-administered interview questionnaires, consists of two parts: part 1: Nurses' characteristics, part 2: Nurses' knowledge regarding fluid and electrolyte management. The second tool: Nurses' practices observational checklist. **Results:** Based on the findings of the present study. More than half (53.3%) of the studied nurses had an unsatisfactory level of knowledge, while about two-thirds (61.7%) had an incompetent level of reported practice regarding fluid and electrolytes management for the patient undergoing cardiac surgeries. **Conclusion:** The current study clarifies that there was a statistically significant positive correlation between the total level of practice and the total level of knowledge among the studied nurses at p-value <0.05. **Recommendations:** Develop continuous educational programs to enhance the nurses' knowledge and practice regarding fluids and electrolyte management for patients undergoing cardiac surgeries.

Keywords: *Cardiac Surgeries, Fluids and Electrolytes, Nurses' Performance*

INTRODUCTION

Cardiovascular surgery, also referred to as cardiac surgery or heart surgery, describes any surgical procedure that involves the heart or the blood vessels that carry blood to and from the heart. These procedures are common with patients who have heart disease or have had a heart attack, stroke, or blood clot as well as individuals who are at high risk of developing these problems. However, cardiovascular surgery isn't always necessary to treat heart problems, doctors may recommend it for a variety of reasons, including treating or preventing heart attacks and clots, addressing irregular heartbeats, opening blocked or narrowed arteries, repairing congenital heart problems, and fixing damaged or diseased heart valves ***(Feng et al., 2022).***

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The perioperative period is a highly dynamic time with the perturbations of anesthesia, cardiopulmonary bypass, and the surgery itself. Added to this are such variables as the patient's preoperative condition and the effects of the postoperative surgical stress response. Patients' assessment of fluid and electrolyte status for early detection of these complications is an important component of nursing care. Therefore, monitoring of intake and output, weight, hemodynamic parameters, hematocrit levels, distension of neck veins, edema, and electrolyte levels should be carried out regularly by nursing staff ***(Audet et al., 2021).***

Although fluid balance appears routine daily care, the recording of fluid balance was imperfectly done. Recording fluid intake and output is continuously considered an important part of patient care. It is the nurse's responsibility to ensure that fluid balance is managed accurately. Electrolytes have many functions, such as regulating heart rhythms and affecting the amount of water retained in your body ***(Walton et al., 2024).***

Nursing management depends upon the clinical status of the patient and the correction of the underlying cause. Critical care nurses are responsible for delivering prescribed nutrition, fluids, and medication safely and effectively to CHF patients. Nursing interventions include assessment, monitoring of vital signs, skin temperature and peripheral pulses, results of tests, and oxygen saturation, implementing strategies to treat fluid and electrolyte imbalances, and instructing a patient to get adequate bed rest and sleep ***(Lin et al., 2024).***

Nurses' knowledge and clinical practices are fundamental to the successful care of patients undergoing cardiac surgery. Their expertise spans preoperative, intraoperative, and postoperative phases, requiring a combination of technical skills, critical thinking, and compassionate care. With advances in surgical techniques and patient management protocols, maintaining up-to-date knowledge and practices is essential for optimal outcomes ***(Mohamed et al., 2023).***

Significance of the study:

The annual volume of major surgery worldwide is estimated to be more than 300 million patients (about 5% of the world population), which is a 34% increase from 2004 to 2012.1,2 Nearly 74% of these operations are performed in countries spending substantial amounts on health care. When applied to European Union countries, which had an overall population of 448 million in 2020 (27 countries), this figure translates into a crude estimate of nearly 22 million major procedures annually ***(Halvorsen et al.,2020)***.

From the investigator's point of view the problem of fluid and electrolyte imbalance is critical, particularly in cardiac surgery patients who usually do not require long-term hospitalization but need good care, with compliance to a therapeutic regimen for maintenance of adequate fluid and electrolyte balance for life. Otherwise, they may suffer serious problems that may be fatal. The nurse has an important role in helping these patients to comply with their treatment regimen Therefore, the current study aimed to assess nurses' performance. Regarding fluids and electrolytes management for the patient undergoing cardiac surgeries

AIM OF THE STUDY

This study aimed to assess nurses' performance regarding fluids and electrolyte

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management for the patient undergoing cardiac surgeries.

Research questions:

1- What are the nurses' levels of knowledge regarding fluid and electrolytes management for the patient undergoing cardiac surgeries?

2-What are the nurses' levels of practice regarding fluids and electrolytes management for the patient undergoing cardiac surgeries?

SUBJECT AND METHODS

The subject and methods for the current study were portrayed under the four main items as the following:

I. Technical item.
II. Operational item.
III. Administrative item.
IV. Statistical item.

I) Technical items:

The technical item included research item, setting, subjects and tools of data collection used in this study.

Research design:

A descriptive research design was utilized in this study.

Setting:

This study was conducted at the National Heart Institute's cardiac surgery center affiliated with the Ministry of Health**.**

Subject:

A convenient sample of all available nurses caring for the patients who are undergoing cardiac surgeries in the previously mentioned setting included in the cardiac study of about 60 nurses.

Data collection tools:

Data was collected by using two tools:

The first tool: Self-Administered Interview Questionnaire**s**: It was developed by the investigator based on a review of relevant recent literature ***(Hosny et al. 2022)*** and written in simple Arabic. It included two parts:

Part I: It was used to address the nurses' characteristics. It was included (Age, level of education, qualifications, years of experience, attendance of training programs, etc.)

Part 2: This part concerned with nurses' basic knowledge regarding fluid and electrolyte management (monitoring, preparation, administration, recording, fluid balance for cardiac surgery patients, and knowledge regarding electrolyte balance for cardiac surgery patients).

Scoring system:

Scoring system for part (2) of nurses' knowledge regarding fluid and electrolyte balance: correct answer (1) and the incorrect (0), the scores were summed up and the total was divided by the total number of questions and then it was converted into a percentage. The nurses' knowledge was considered.

- **Satisfactory ≥ 80**
- **Unsatisfactory < 80 %.**

The second tool: Nurses' practices observational checklist (Appendix II), this

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tool was adopted by the investigator based on review of relevant recent literature ***(Hosny et al 2022.)*** and used to assess nurses' practices regarding fluids and electrolytes, and included (preparation, administration, monitoring and documentation) for patient undergoing cardiac surgeries.

Scoring system:

Scoring system for nurses' practice observational checklist: Items were checked as (done) with score (1) or (not done) with score (0). The total score was divided by the number of items and was converted into a percentage. The nurses' practice was considered.

- **Competent ≥ 80 %**
- **Incompetent < 80%**

Validity and reliability:

The validity of the tools is whether or not the instrument measured what it is designed to measure. It was done by seeking the opinions of a jury group consisting of five assists. professors of Medical-Surgical Nursing at the faculty of Nursing Helwan University who judged their clarity, comprehensiveness, accuracy, relevance, and whether it elicited the type of information sought thus, the tools were the face and content-validated. The tools were modified and rephrased based on the jury's opinions. This phase took three weeks.

Reliability and validity are concepts used to evaluate the quality of research. They indicate how well a method, technique, or test measures something. Reliability is the consistency of a measure and the degree to which an instrument measures the same way each time it's used under the same conditions with the same subject, and validity is about the accuracy of a measure (Aithal and Aithal, 2020). Testing reliability alpha Cronbach is the model of internal consequences.

Pilot study:

A Pilot study was carried out on 10% of nurses (6 nurses) to test feasibility, objectivity, clarity, and the applicability of the study tools, as well as identify difficulties that may be encountered during the application of the study and to estimate the time needed for data collection. The data obtained from the pilot study were analyzed manually, and based on the result of the pilot study, the needed refinement and necessary modification were done. Accordingly, very simple modifications were added, and others were rephrased to be clear and understood but not affect the tool. Following this pilot study, the final forms of the tools were ready for use.

Field of work:

Once the necessary approvals were granted to proceed with the proposed study, the subjects were interviewed by the investigator to collect the necessary data after an explanation of the purpose of the study. According to the previously mentioned study criteria, knowledge related to the fluids and electrolyte balance of nurses working in cardiac surgery units was assessed, and nurses' practices were observed using the nurses' practice observational checklist.

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Preparatory phase:

An official approval letter clarifying the purpose of the present study was issued from the Dean of the Faculty of Nursing at Helwan University to the general director of the National Heart Institute's cardiac surgery center and Scientific Research Ethical Committee in the Faculty of Nursing as an approval to conduct this study. A review of the current national and international literature related to the research title was done using textbooks, articles, and magazines. Implementation of this study required the development of two tools for the assessment of nurses' knowledge and performance regarding fluid and electrolyte management for cardiac surgery patients.

After obtaining administrative approval, data collection was started and continued for a period of 3 months, from the beginning of January 2024 to the end of March 2024. The researcher attended three days/week (Saturday, Sunday, and Wednesday) from 9:00 am to 12:00 midday.The investigator started by introducing herself to the nurses and giving a transitory explanation regarding the study's aim. Verbal consent was obtained from participants before their inclusion. The investigator highlighted that sharing was completely voluntary and private. Privacy and safety were guaranteed, as well as the right to withdraw from the study. during morning and afternoon shifts alternatively for two weeks. Then, the self-administered interview was distributed to each nurse to assess nurses' performance regarding fluids and electrolytes management for the patient undergoing cardiac surgeries. The questionnaire took about 20-30 minutes to complete. All nurses were informed that the collected data would be used only for the present study.

Ethical considerations:

The research approval was issued from the Scientific Research Ethical Committee in the Faculty of Nursing at Helwan University before starting the study. The investigator clarified the study's importance and aim to all the nurses included in the study. Oral consent was obtained from all the studied nurses. The questionnaire didn't include any immoral statements that touch the nurses' beliefs, dignity, culture, tradition, and religious issues. All nurses were informed that they were allowed to choose whether to participate or not in the study and that they have the right to withdraw from the study at any time without giving any reason, and confidentiality of the information was assured.

Administrative item:

After explaining the study's aim and objectives, official permission was obtained from the Faculty of Nursing director at Helwan University and the director of the National Heart Institute's cardiac surgery center asking for cooperation and permission to conduct the study.

Statistical item:

Data collected from the sample studied was revised, coded, and entered using a personal computer (pc). Computerized data

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entry and analysis were performed using Statistical Package for the Social Sciences version 26 (SPSS). Data were presented using descriptive statistics in the form of frequencies and percentages. The chi-square test ($\chi 2$) was used for comparison between variables. Spearman's correlation measures the strength and direction of association between two ranked variables. Also, it is used for Mean SD .

Significance of the results:

- Highly statistically significant at P-value ≤ 0.01
- Statistically significant at p-value >0.05
- Non-significant at p-value > 0.05.

Pearson Correlation Coefficient Calculator:

The Pearson correlation coefficient measures the strength of a linear association between two variables, where the value r = 1 means a perfect positive correlation and the value r = -1 means a perfect negative correlation .

RESULTS

Table (1): Frequency and percentage Distribution of personal characteristics of the studied nurses (n=60).

Personal characteristics	N	%
Age (in years)		
20-<25	11	18.3
25-<30	22	36.7
30-<35	21	35.0
More than 35	6	10.0
Mean ±SD	31.08 ± 4.26	
Gender		
Male	14	23.3
Female	46	76.7
Educational level		
Nursing school diploma	6	10.0
Technical nursing institute	32	53.3
Bachelor of nursing	22	36.7
Others	0	0.0
Years of experience		
Less than one year	3	5.0
1-<5	37	61.7
5-<10	15	25.0
≥10	5	8.3
Mean ±SD	5.03±2.3	
Attended training courses related to fluids and electrolytes management for cardiac surgeries patients		
Yes	17	28.3
No	43	71.7

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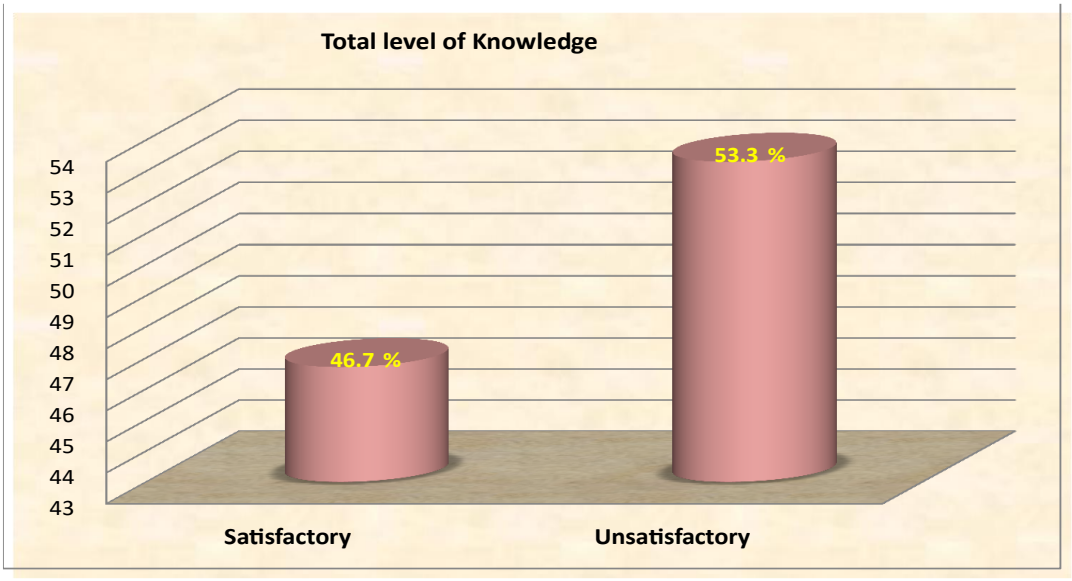

Figure (1): Frequency and percentage Distribution of the studied nurses according to nurses' total level of knowledge (n=60).

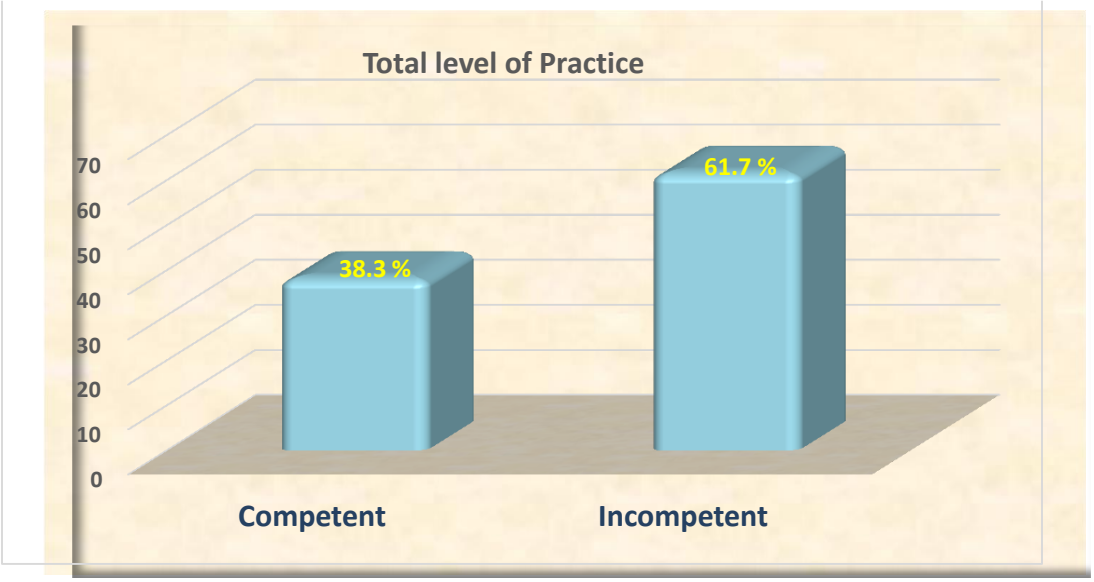

Figure (2): Frequency and percentage Distribution of the studied nurses according to nurses' total level of practices (n=60).

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Table (2): Relationship between personal characteristics of the studied nurses and nurses' total level of knowledge (n=60)

Personal characteristics		Total level of knowledge				X^2	P-value
		Satisfactory		Unsatisfactory			
		N	%	N	%		
Age (in years)	20-<25	8	13.3	3	5.0	5.889	**0.014* (S)**
	25-<30	11	18.3	11	18.3		
	30-<35	6	10.0	15	25.0		
	50-60	3	5.0	3	5.0		
Gender	Male	13	21.7	1	1.7	5.654 FET	0.117 (NS)
	Female	15	25.0	31	51.7		
Educational level	Diploma	3	5.0	3	5.0	1.045	**0.053* (S)**
	Institute	13	21.7	19	31.7		
	Bachelor	12	20.0	10	16.7		
Years of experience	Less than one year	1	1.7	2	3.3	1.969	0.579 (NS)
	1-<5	19	31.7	18	30.0		
	5-<10	5	8.3	10	16.7		
	≥10	3	5.0	2	3.3		
Attending Training courses	Yes	13	21.7	4	6.7	8.466 **FET**	**0.004* (S)**
	No	15	25.0	28	46.7		

X^2= Chi-Square Test **FET**= Fisher Exact Test P-value > 0.05 **Non-significant** * P-value ≤ 0.05 **Significant**

Table (3): Relationship between Personal characteristics of the studied nurses and nurses' total level of practices (n=60).

Personal characteristics		Total level of practice				X^2	P-value
		Competent		Incompetent			
		N	%	N	%		
Age (in years)	20-<25	5	8.3	6	10.0	6.050	0.109 (NS)
	25-<30	12	20.0	10	16.7		
	30-<35	4	6.7	17	28.3		
	50-60	2	3.3	4	6.7		
Gender	Male	5	8.3	9	15.0	1.053	0.818

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	Female	18	30.0	28	46.7		(NS)
Educational level	Diploma	3	5.0	3	5.0	1.881	**0.039* (S)**
	Institute	14	23.3	18	30.0		
	Bachelor	6	10.0	16	26.7		
Years of experience	Less than one year	1	1.7	2	3.3	4.206	**0.020* (S)**
	1-<5	17	28.3	20	33.3		
	5-<10	5	8.3	10	16.7		
	≥10	0	0.0	5	8.3		
Training courses	Yes	9	15.0	8	13.3	2.141	**0.043* (S)**
	No	14	23.3	29	48.3		

X^2= Chi-Square Test P-value > 0.05 =**Non-significant (NS)** * P-value ≤ 0.05= **Significant (S)**

Table (4): Correlation between total level of knowledge and total level of practices among the studied nurses.

Variables	**Total Level of Knowledge**	
	r	P-value
Total level of practice	0.623	**0.016***

r=Spearman correlation coefficient * P-value ≤ 0.05 = **Significant (s)**

Table (1): Reveals that 36.7 % of the studied nurses were in the age group 25-<30 years with mean age 31.08 ± 4.26 and 76.7% of them were female. Also, 53.3% of the studied nurses had a technical nursing institute. Additionally, 61.7% of studied nurses had 1-<5 years of experience with a mean of 5.03±2.3 years. Moreover, 71.7% of the studied nurses didn't attend training courses related to fluids and electrolyte management for cardiac surgery patients.

Figure (1): illustrates that 53.3% of the studied nurses had unsatisfactory level of knowledge while 46.7% of them had satisfactory level of knowledge regarding fluids and electrolytes management for the patient undergoing cardiac surgeries.

Figure (2): illustrates that 61.7% of the studied nurses had an incompetent level of practice while 38.3% of them had a competent level of practice regarding fluids and electrolytes management for the patient undergoing cardiac surgeries.

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Table (2): reveals that there was a significant statistical relationship between nurses' total level of knowledge and their age, educational level, and attending training courses at P-value=0.014, 0.053 and 0.004, respectively. There was no significant statistical relationship between nurses' total level of knowledge and their gender and years of experience at P-value =0.117 and 0.579 respectively.

Table (3): reveals that there was a significant statistical relationship between nurse's total level of practices and their educational level, years of experience and attending training courses at P-value=0.039, 0.020 and 0.034 respectively. While there was no significant statistical relationship between nurse's total level of practices and their age and gender at P-value =0.109 and 0.818 respectively.

Table (4): reveals that there was a statistically significant positive correlation between the total level of practices and total level of knowledge among the studied nurses at P- value=0.016.

Discussion

Nurses' knowledge and practices about fluid monitoring and electrolyte administration in cardiac surgery patients are necessary to provide a good quality of care and help to reduce the morbidity and mortality rate. Moreover, evidence-based practices can be applied if nurses have knowledge and practices to provide quality of care to the patients. In addition, there is a need to investigate the knowledge and practices of nurses about fluid and electrolytes monitoring and administration among cardiac surgery patients due to the poor healthcare services among the public hospitals (***Hosny et al., 2022).***

Concerning the age of the studied nurses, the results of the present study revealed that more than one-third of the studied nurses were in the age group of less than 25 to more than 30 years, with a mean age of 31.08 ± 4.26. From the investigator's point of view, that may be related to the dynamics of career entry and retention. age also plays a role in determining the level of experience and specialization among nurses in Egypt. Younger nurses, typically in their early 20s, may possess fresh, up-to-date knowledge from recent education, including familiarity with modern technology and contemporary nursing practices. However, they often lack the hands-on experience that older nurses bring to the job. Nurses over 30 usually have more practical experience, which allows them to handle complex cases and take on supervisory roles, mentoring younger staff and providing a critical link in knowledge transfer within healthcare facilities.

This finding agrees with ***Mohamed et al. (2021),*** who conducted a study entitled "Developing nursing standard for maintaining fluid and electrolyte balance for critically Ill children at pediatric intensive care unit" and reported that less than half of the studied nurses were between 25 to 35 years old. In addition this finding in the same line with ***Mahmoud, (2023)*** who conducted the study entitled:" Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that more than half of the studied nurses were between >25- 35 years old with mean and standard deviation 26.98 ±3.15. On contrary, this finding disagreement ***Hosny et al., (2022***) who conducted the study entitled: "Assessment of Nurses' knowledge and Performance Regarding Fluid and Electrolyte Management for Cardiac Surgery Patients "found that about half of the studied nurses aged 26- 30 years and more than one third aged 20-25 years with mean age was 29.6 years.

Concerning gender, the current study reveals that more than three-quarters of the studied

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nurses were female. From the investigator's point of view, that may be related to that in Egypt, the nursing profession has traditionally been dominated by women, a trend that aligns with global patterns in healthcare. Social expectations often channel women toward caregiving roles, with nursing seen as an extension of traditional responsibilities like nurturing and caregiving. Additionally, cultural norms in Egypt may encourage women to pursue professions perceived as safer or more socially acceptable within their communities, with nursing fitting this criterion. Education pathways also play a role, as nursing programs often attract more women due to historical and societal associations of the field with femininity. Consequently, over three-quarters of nurses in Egypt are female, a reflection of both cultural and societal influences on career choices.

These findings are in the same line with ***Hosny et al., (2022***) who conducted the study entitled: "Assessment of Nurses' knowledge and Performance Regarding Fluid and Electrolyte Management for Cardiac Surgery Patients "found that more than three fourth of studied nurses are females. On contrary, this finding disagreement ***Mahmoud, (2023***) who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that more than half of the studied were male.

Regarding the level of education, the current study reveals that more than half of studied nurses had technical nursing institute. From the investigator's point of view that may be due to the accessibility and practicality these programs offer. Technical institutes often provide shorter, more focused training compared to traditional university programs, allowing students to enter the workforce more quickly. Additionally, these institutes are widely available, often located in urban as well as rural areas, which increases their accessibility for a larger segment of the population. For many, this route is also more affordable, making it a feasible option for individuals seeking stable employment in nursing without the financial burden of extended education. As a result, technical nursing institutes attract a significant number of aspiring nurses, contributing to the high proportion of graduates from these programs in the nursing workforce.

These findings disagree with ***Hosny et al., (2022***) who conducted the study entitled: "Assessment of Nurses' knowledge and Performance Regarding Fluid and Electrolyte Management for Cardiac Surgery Patients "found that about two thirds were highly educated (bachelor's degree). On other hand, this result agreement with study ***by Hassan, (2021***) who conducted study about "assessment of nurses' knowledge and practice regarding fluids and electrolyte imbalance in critical care units" and showed that less than half of the studied nurses had secondary school diploma. On other hand, this result disagreement with Mahmoud, (2023) who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that more than half of the studied nurses were male and had bachelor's degree of nursing.

As regards the year of experience, the current study reveals that more than two thirds of studied nurses had less than 1to less than 5 years of experience with mean 5.03±2.3 years. From the investigator point of view that may be related to nursing is a demanding and often stressful profession, leading to high turnover rates, especially among new graduates who may face challenges adjusting to the demands of the job. Additionally, there may be an influx of recent nursing graduates due to ongoing recruitment

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efforts to meet the increasing demand for healthcare services. However, experienced nurses may be more likely to advance into specialized roles, managerial positions, or even leave the profession, further contributing to a younger workforce with fewer years of hands-on experience.

This finding in the same line with ***Mahmoud, (2023***) who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that more than half of the studied nurses' experience were from 1 to less than 5 years old while, these findings disagree with ***Hendy Gouda, (2019***) who conducted the study entitled: "Factors affecting postoperative nursing performance in the surgical units" reported that years of experience ranging from 5 to 9 years in most of them.

Concerning training, the current study reveals that more than two thirds of the studied nurses didn't attend training courses related to fluids and electrolytes management for cardiac surgeries patients. From the investigator point of view that may be related to that lack of attendance could stem from several factors, including limited availability of specialized training programs and the often-high demands of nursing workloads that restrict time for additional education. Additionally, some hospitals may not prioritize ongoing training in this area, or there may be insufficient support and resources allocated for nurses' professional development. Consequently, without targeted training, nurses may feel less confident or prepared to manage fluids and electrolytes effectively in cardiac surgery settings, potentially impacting patient outcomes.

These findings disagreement ***Hosny et al., (2022***) who conducted the study entitled: "Assessment of Nurses' knowledge and Performance Regarding Fluid and Electrolyte Management for Cardiac Surgery Patients "found that more than two thirds of the studied nurses attended fluids and electrolyte related workshops, more than one third of them 30.7% attending only one workshop. As well, this finding disagreement with ***Mahmoud, (2023***) who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that less than half of the studied had attended training courses related fluid & electrolyte balance.

Regarding basic knowledge; more than half of the studied nurses had unsatisfactory level of knowledge while, more than half of them had unsatisfactory level of knowledge according to fluid balance and more than two thirds of them had unsatisfactory level of knowledge. From the investigator point of view, that may be related to the complexity of fluid and electrolyte balance requires a deep understanding of physiology, pharmacology, and clinical signs, which might not be emphasized enough in basic training or continuing education programs. Additionally, clinical environments are often fast-paced and demanding, limiting opportunities for nurses to apply theoretical knowledge consistently or receive adequate mentorship in this area. Limited access to specialized training and resources, combined with a lack of regular competency assessments on these topics, may further contribute to this knowledge gap. Addressing this issue would likely require an emphasis on structured education, ongoing professional development, and supportive supervision to help nurses manage such critical aspects of patient care effectively.

These findings agree with ***Hosny et al., (2022)*** who conducted the study entitled: "Assessment of Nurses' knowledge and Performance Regarding

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Fluid and Electrolyte Management for Cardiac Surgery Patients "reported that the majority of the studied nurses had poor levels of knowledge regarding basic knowledge. In addition, The current results come hand on hand with the study done in the United States by ***Eldsouky et al., (2016)*** who conducted the study entitled: Nurses' knowledge and practice concerning fluid and electrolyte balance among patients with congestive heart failure" revealed a low level of knowledge. The authors concluded that there is a need to develop interventions to improve nursing knowledge, since these nurses provide care to critical cases, and thus should possess enough knowledge background to be able to provide quality care for these patients.

Regarding fluids and electrolytes management, more than half of the studied nurses had unsatisfactory level of knowledge while, less than half of them had satisfactory level of knowledge for the patient undergoing cardiac surgeries. From the investigator point of view that may be a lack of emphasis on this topic during initial nursing education or training programs, where core competencies may be prioritized over specialized or complex knowledge areas. Furthermore, ongoing education and professional development opportunities might be limited or insufficient, leaving nurses without up-to-date information on best practices in fluid and electrolyte management. Additionally, high workloads and staffing shortages can prevent nurses from having the time to engage in continuous learning, limiting their ability to refine or deepen their knowledge in this critical area. Lastly, some healthcare settings may lack the resources to support consistent training or provide easy access to updated clinical guidelines, further contributing to knowledge gaps. Together, these factors can lead to an overall unsatisfactory level of understanding and confidence in managing patients' fluid and electrolyte needs effectively.

These findings agree with ***Elsayed, (2022***) who conducted the study entitled: "Effect of Hybrid Educational Program on Nurses' Performance regarding Caring of Patients with Fluid and Electrolytes Imbalance in Critical Care Units" reported that more than half of the studied nurses had poor levels of knowledge regarding fluid balance.

Regarding preparing and monitoring, more than half of the studied nurses were competent of preparing and monitoring while, nearly two thirds and more than half were incompetent in administering and recording respectively. From the investigator point of view this reflects their understanding of critical patient care skills, particularly in managing fluid balance, which is essential in various medical settings to prevent complications such as dehydration or electrolyte imbalances. Meanwhile, a portion of the nursing chores did not reach this level of competency, suggesting that additional training or resources could be beneficial. Overall, the findings highlight a considerable level of expertise among the nurses, with a significant proportion able to effectively oversee this aspect of patient care.

These findings agree with ***Sheta, (2018)*** who conducted the study entitled: "Effectiveness of Structured Educational Program on Knowledge and Practice among Nurses Regarding Body Fluid Balance Assessment for Critically Ill Patients" showed that the minority of nurses responded regarding knowledge about responsible persons for fluid monitoring as strongly disagree, less than one third were disagreeing, minority were uncertain, less than one third were agree and less than one third were strongly agree. On the other hand, the current study disagreeing ***Mohamed, (2019***) who

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conducted the study entitled: "Effect of Educational Protocol Regarding Accurate Monitoring Fluid Balance on Critical Care Nurses' Knowledge and Practice" found that more than half of the studied nurses had poor levels of knowledge regarding fluid balance and more than three thirds of the studied nurses had poor levels of knowledge regarding electrolyte balance in cardiac surgery patients.

Regarding total knowledge, more than half of the studied nurses had unsatisfactory level of knowledge while less than half of them had satisfactory level of knowledge regarding fluids and electrolytes management for the patient undergoing cardiac surgeries. From the investigator's point of view that due to several factors, first, limited access to ongoing training and professional development on fluid and electrolyte management may have contributed to knowledge gaps. Many healthcare facilities often prioritize training in more immediate clinical skills, leaving advanced or specialized topics like fluid and electrolyte balance less emphasized. Additionally, a high workload and time constraints can prevent nurses from staying up to date with the latest evidence-based practices in this area. In some cases, the educational curricula for nursing may lack in-depth content on fluid and electrolyte management, leading to a weaker foundational understanding that may not be reinforced without continuous education. These combined factors contribute to the knowledge deficit, affecting nurses' confidence and competence in managing fluid and electrolyte balance for patients.

These findings agree with ***Mahmoud, (2023),*** who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that more than two thirds of the studied nurses had unsatisfactory level of knowledge. On the other hand, more than one third had a satisfactory level of knowledge. Additionally, ***Mogileeswari (2016)*** and ***Mohamed et al., (2018***) represented that unsatisfactory knowledge level regarding fluid balance monitoring mostly prominent in their studies in pre- educational protocol. Also, a study by ***Abd Elalem, (2018***) assessed critical care nurses′ knowledge and practice regarding the assessment of fluid balance and found that the majority of the studied nurses had poor level of knowledge regarding the fluid balance assessment.

Contrary to the current results, findings by ***Asfour., (2016***) who stated study entitled "Fluid balance monitoring accuracy in intensive care units "documented moderately adequate level of knowledge regarding fluid balance monitoring between studied nurses and emphasized that nurse's knowledge and skills regarding assessment and monitoring of body fluids should be enhanced and evaluated to prevent severe problems in body homeostasis especially for those suffering serious diseases.

Regarding studied nurses' reported practice regarding fluids and electrolytes management for the patient undergoing cardiac surgeries, the current study reveals that more than two thirds of the studied nurses had incompetent level of reported practice while more than one third of them had competent level of reported practice regarding fluids and electrolytes management for the patient undergoing cardiac surgeries. From the investigator's point of view that lack of competence may stem from several factors.

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Firstly, gaps in training and continuing education programs often leave nurses underprepared to handle complex aspects of fluid and electrolyte balance, which require both theoretical understanding and practical skills. Additionally, heavy workloads and time constraints can limit opportunities for thorough assessment and monitoring of these critical parameters in patients. Limited access to resources, including protocols and guidelines specific to electrolyte management, further exacerbates this issue. Consequently, without structured support and regular training updates, many nurses struggle to maintain competence in this vital area of patient care.

This result agreement with study by ***Bayoumi, et al., (2022***) who conducted study about "changes in nurses' knowledge and clinical practice in managing local IV complications following an education intervention" and reported that most of the studied nurses had poor practices regarding Monitoring an IV Site and Infusion. On the other hand, these findings disagree with ***Mahmoud, (2023***) who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that less than two thirds of the studied nurses were competent and rest of them were incompetent. As well, this result disagreement with study ***by Sheta, & Mahmoud, (2018***) that conducted study entitled: "effectiveness of structured educational program on knowledge and practice among nurses regarding body fluid balance assessment for critically ill patients" and illustrated that most of the studied nurses had satisfactory practice about fluids and electrolytes balances.

Regarding relation between variables, the current study reveals that there was a statistically significant relation between nurse's total level of knowledge and total level of reported practices regarding fluids and electrolytes management for the patient undergoing cardiac surgeries. From the investigator point of view that nurses with higher knowledge levels about fluids and electrolytes are more likely to apply this knowledge in practice, resulting in better patient outcomes and vice versa. Understanding the delicate balance of fluids and electrolytes enables nurses to recognize imbalances, make informed decisions, and promptly respond to changes in patients' conditions.

This finding was in harmony with study by ***Hosny et al., (2022***) who conducted study about "Assessment of Nurses' knowledge and Performance Regarding Fluid and Electrolyte Management for Cardiac Surgery Patients "reported that there was highly statistically significant relation between total knowledge and training courses related fluid & electrolyte balance. Additionally, this findings agreement with ***Mahmoud, (2023)*** who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that there was highly statistically significant relation between total knowledge and training courses related fluid & electrolyte balance. From an investigator point of view attending continuing nursing education courses and training programs have the benefits of keeping nurses up-to-date and refining their practices.

Regarding correlation, the current study revealed that there was a statistically significant positive correlation between the total level of reported practices and total level of knowledge among the studied nurses regarding fluids and electrolytes management for the patient undergoing cardiac surgeries. From the investigator's point of view that nurses' understanding of these concepts increases, they

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are more likely to implement best practices effectively. Knowledge empowers nurses to make informed decisions, recognize complications early, and take proactive measures to maintain patient stability. In managing fluids and electrolytes, precise adjustments are crucial for cardiac patients due to their heightened vulnerability to shifts in electrolyte levels, which can affect cardiac function. Nurses with a strong foundation in these topics can better interpret patient needs, apply protocols, and respond accurately to changes in patient condition, thus reflecting positively in their reported practices. This correlation emphasizes the importance of continuous education and training for nurses, enhancing both their competence and confidence in handling complex patient cases.

These findings matched with ***Elsayed& Saad, (2022)*** who conducted study about "Effect of Hybrid Educational Program on Nurses' Performance regarding Caring of Patients with Fluid and Electrolytes Imbalance in Critical Care Units" and proved that there was positive correlation among items of knowledge and subscales of practice about Fluid and Electrolytes Imbalance. Additionally, this findings agreement with ***Mahmoud, (2023***) who conducted the study entitled: "Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients "found that there was positive correlation between total knowledge and "fluid parameters measurement, nursing interventions toward maintaining fluid balance, initiating a peripheral, venous access iv infusion, monitoring an I.V site and infusion and administering a blood transfusion.

CONCLUSION

Based on the findings of the present study. More than half of the studied nurses had an unsatisfactory level of knowledge, while less than half of them had a satisfactory level of knowledge. Additionally, about two-thirds of the studied nurses had an incompetent level of reported practice regarding fluid and electrolytes management for the patient undergoing cardiac surgeries, while more than one-third of them had a competent level. Furthermore, there was a statistically significant positive correlation between the total level of practice and the total level of knowledge among the studied nurses at p-value=0.016.

Recommendations

Based on the current study results, the following recommendations were suggested:

- Develop continuous educational programs to enhance the nurses' knowledge and practice regarding fluids and electrolyte management for patients undergoing cardiac surgeries.
- Further studies are also needed to assess nurses' performance regarding fluids and electrolyte management for patients undergoing cardiac surgeries
- Develop a booklet using simple language to simplify information about fluids and electrolyte management for patients undergoing cardiac surgeries.
- Replication of the study on large subjects from different hospitals and in different geographical areas in Egypt for generalization of findings and to assess nurses' performance regarding fluids and electrolyte management for patients undergoing cardiac surgeries.

References

AbdElalem S, Fouad N, (2018): Effect of an instruction intervention about body fluid balance assessment on knowledge and practice among nurses in Intensive Care Unit International Journal of Novel Research in Healthcare and Nursing; 5 (1): 94-105.https://www.iosrjournals.org/iosrjnhs/ papers/vol7issue5/Version-11/G0705117483.pdf

ISSN 2786-0183

Helwan International Journal for Nursing Research and Practice

Vol. 4, Issue 11, Month: September 2025, Available at: https://hijnrp.journals.ekb.eg/

Asfour, H. I. (2016): Fluid balance monitoring accuracy in intensive care units. IOSR J Nur Heal Sci, 5(4VI), 53-62.DOI: 10.9790/1959-0504015362

Audet, L. A., Paquette, L., Bordeleau, S., Lavoie-Tremblay, M., & Kilpatrick, K. (2021): The association between advanced practice nursing roles and outcomes in adults following cardiac surgery: A systematic review of randomized controlled trials. International Journal of Nursing Studies, 122, 104028.

Bayoumi, M. M. M., Khonji, L. M. A., & Gabr, W. F. M. (2022): Changes in nurses' knowledge and clinical practice in managing local IV complications following an education intervention. British Journal of Nursing, 31(8), S24-S30.

Eldsouky, S. E., Taha, N. M., & Saleh, M. D. (2016): Nurses' knowledge and practice concerning fluid and electrolyte balance among patients with congestive heart failure. Zagazig Nursing Journal, 12(1), 114-128.

Elsayed, E., & Saad, N. S. E. D. (2022): Effect of Hybrid Educational Program on Nurses' Performance regarding Caring of Patients with Fluid and Electrolytes Imbalance in Critical Care Units. International Egyptian Journal of Nursing Sciences and Research, 2(2), 253-268.

Feng, W., Zhou, J., Lei, Y., Chen, W., Miao, Y., Fu, X., & Lou, W. (2022): Impact of rapid rehabilitation surgery on perioperative nursing in patients undergoing cardiac surgery: A meta-analysis. Journal of cardiac surgery, 37(12), 5326-5335.

Hassan, A. (2021): Effect of applying guidelines on nurses' performance regarding fluid and electrolyte imbalance in. Port Said Scientific Journal of Nursing, 8(2), 14-36.

Hendy Gouda, A., Talaat Mohammed, E., & Ali Ameen, D. (2019): Factors affecting postoperative nursing performance in the surgical units. Egyptian Journal of Health Care, 10(1), 50-64.

Hosny, A., Sherief, W., & Mohamed, M. (2022): Assessment of Nurses' Knowledge and Performance Regarding Fluid and Electrolyte Management for Cardiac Surgery Patients. Mansoura Nursing Journal, 9(1), 31-40.

Lin, H., Dong, D., Zheng, K., & Xu, Q. (2024): A Comprehensive Intervention Program for Postoperative Delirium Prevention in Elderly Patients Undergoing Cardiac Surgery. Journal of Peri Anesthesia Nursing.

Mahmoud, F. H., Ammar, S. A., & Mohamed, A. S. M. (2023): Nurse's Knowledge and Practice Regarding Care of Fluids and Electrolytes Imbalance among Critically Ill Patients. Journal of Survey in Fisheries Sciences, 10(3S), 4257-4266.

Mogileeswari P, Ruth M., (2016): Knowledge and practice regarding fluid and electrolyte replacement therapy for patients with burns. International Journal of Multidisciplinary Research and Development;3(4): 217-20.bibliomed.org/mnsfulltext/157/157-1456722419.pdf?1608308443

Mohamed M., Mohammed I., Taha S (2018): Effect of Educational Protocol Regarding Accurate Monitoring Fluid Balance on Critical Care Nurses' Knowledge and Practice. Minia Scientific Nursing Journal (Print) (ISSN 2537-012X) 4(1) 2018. http://main.eulc.edu.eg/eulc_v5/Libraries/Thesis/BrowseThesisPages.aspx?fn=PublicDrawThesis&BibID=12557775

Mohamed N, Hassan A & Mohamed E., (2021A): Developing nursing standard for maintaining fluid and electrolyte balance for critically Ill children at pediatric intensive care unit. International Journal of Advance Research in Nursing.

Mohamed, AboBakr, E., Elsayed Ibrahiem, A., & Ali Ameen, D. (2023): Effect of Nursing Interventional Program on Stressors for Patients undergoing Cardiac Surgery. Egyptian Journal of Health Care, 14(4), 1171-1187.

Mohamed, M., Mohammed I, & Taha,S.(2019): Effect of Educational Protocol Regarding Accurate Monitoring Fluid Balance on Critical Care Nurses' Knowledge and Practice Thesis for Doctor Degree in nursing science, Faculty of Nursing, Minia University, PP176-178

ISSN 2786-0183

Helwan International Journal for Nursing Research and Practice

Vol. 4, Issue 11, Month: September 2025, Available at: https://hijnrp.journals.ekb.eg/

Sheta, H., & Mahmoud, M. (2018): Effectiveness of Structured Educational Program on Knowledge and Practice among Nurses Regarding Body Fluid Balance Assessment for Critically Ill Patients. IOSR Journal of Nursing and Health Science (IOSRJNHS), 7, 74-83.

Walton, L. L., Duff, E., Arora, R. C., & McMillan, D. E. (2024): The Role of the Cardiac Surgery Patient in Pain Management: The Patient Perspective. Clinical Nursing Research, 33(7), 538-544.