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St. Paul's Hospital Millennium Medical College



Graduate Study Program St. Paul Hospital Millennium Medical College

Post-Cardiac Surgery Nurses' care Practice for patients Underwent Open Heart Surgery and Associated Factors in Selected Cardiac Centers, Addis Ababa, Ethiopia 2023.

By: Lemma Fayyisaa

Addis Ababa Ethiopia

June, 2023



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Addis Ababa, Ethiopia,

June, 2023

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ABSTRACT

Background: Whatever the best standard technologies and procedures were used, open heart surgery outcome worldwide is poor with the absence of standard nursing care. In addition, there is scarcity of studies regarding post open heart surgery care practice status among nurses in Ethiopia.

Objective: This study was aimed to assess Post-cardiac surgery Nurses' care Practice after Open Heart Surgery and Associated factors.

Methods: mixed study design was employed. Both non-participant observation and key informant in-depth interview was used to collected data from purposively sampled 34 nursing staff working in selected cardiac surgery intensive care unit. Standardized observational checklist was used to assess level of practices and key informant in-depth-interview by using semi- structured interview guidelines from March 2023 to May 2023. Descriptive analysis was conducted for quantitative parts and thematic analysis was for qualitative. Finally, both quantitative and qualitative findings were triangulated under each themes and presented in text narration, tables and figures

Result: The response rate was 100%. Only 26.5% of them had cardiac care related training and most of them had experience of less than three years in post-cardiac surgery intensive care unit. About 62% of nurses practiced inadequately. Professional qualification issues, organizational conditions challenges, and continuous professional development were noted as factors affecting nurses' care practice.

Conclusion and recommendation: at all stages of post-cardiac surgery, level of nurses' practice was very inadequate among nurses working in post-cardiac surgery intensive care unit. Giving more attention in specialized professional qualification with adequate number of post-anesthesia care providers, strengthening continuous professional development, being equipped with necessary infrastructures and making conducive work environment with good managing style are core measures to overcome the difficulties.

Keywords: open heart surgery, associated factors, post cardiac surgery nurse's care practice

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ACRONYMS AND ABBREVIATION

AR - Aortic Regurgitation

AS - Aortic Stenosis

CABG – Coronary Artery Bypass Grafting

CVD - Cardio Vascular Disease

CHD - Congenital Heart Diseases

CVSICU - Cardiovascular Surgery Intensive Care Unit

MR - Mitral Regurgitation

MVP - Mitral Valve Prolapse

ICU - Intensive Care Unit

PR - Pulmonary Regurgitation

PVS - Pulmonary Valve Stenosis

RHD - Rheumatoid Heart Disease

TR - Tricuspid Regurgitation

TS - Tricuspid Stenosis

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1. INTRODUCTION

1.1. BACKGROUND

Globally, cardiovascular diseases are the main cause of mortality and disability, making one third of all cause of death on this planet (1). Post-cardiac surgery is a time when the most critical events are tend to happen during hospital stay of the patient underwent open heart surgery. Congenital heart diseases (CHD) are a kind of heart problems seek mostly open heart surgery and in need of crucial nurses' care post-operatively and responsible for about 15 million under five years children death globally and considered as the most common congenital defects affecting 8 out of 1000 newborns (1-3).

Nurses have a greatest role in caring for cardiac patients' especially at time of post-surgical intervention. Therefore it was noted that poor post-surgery nurses' care could result with poor patient outcome; death or complicated. Worldwide, from CVDs related burdens Coronary artery diseases are the common and severe accounting 19.9% among men and 9.7% among women of elderly age and it also responsible for 23.14% of total death in Egypt (3). In 2008 near to 17 million deaths due to cardiovascular disease & complications with poor post cardiac surgery ICU care; from which nurses' role is of greatest share (4). About half of 36 million deaths due to non-communicable disease were due to cardiovascular disease either before or after surgical intervention (3, 5, 6).

Level of nursing care practice post-operatively and the invasiveness of the procedure with CVD affect degree of morbidity and mortality after different cardiovascular surgeries (4, 12). Left ventricular valves dysfunction implantation had 13.2% while, repairing aortic dissection 12% to 24% risk of mortality. About 32.4% of total mortality in Brazil was due to cardiovascular diseases. For which nurses role have either direct or in direct influence for good disease progress and cure (4, 14).

Cardiac surgery is a type of surgery performed on heart muscle, valve, or blood vessels indicated for acquired heart disease such as, aortic valve, tricuspid valve, pulmonary aorta and coronary artery bypass (CABG), and congenital heart diseases (15, 16). Besides its risk of health related complications, mortality and any other social impact, in appropriate nursing care in post cardiac

surgery ICU is able to result with unnecessary costs or catastrophic expenditure for treatment of complications and increased length of ICU stay (12, 17).

Africa contributes the highest number for world-wide CVD burden. Around 500,000 children in Africa born with CHD, and specifically, 11000 children in South African were born with CHD annually during 2016 (9). In 2017, in African sub-Saharan countries the death burden during 30 days following cardiovascular surgeries was 5% to 10%, which were due to post- surgical complications and poor post-operative care particularly of nurses care practice (9, 10).

In Ethiopia need of specialized human power related to cardiac care specially before, during and after cardiovascular surgery from which nursing care practice is a critical and mandatory role is increasing from time to time as need of surgical management is increasing (9, 11). In 2011, from 34% of non-communicable disease death, 15% of deaths were due to CVDs in Ethiopia. By 2017, about 2,838,767 people were affected by CVD, especially (RHD) and (IHD). These all events seek cardiac surgery interventions which are in need of nurse's care plan during full intervention especially post-operatively (11-13).

Since post-cardiac surgery is with full risk of morbidity (bleeding, organ failure, neurological disorder, respiratory failure, low cardiac output, infection and etc.) and mortality complications, it needs special attention of health team particularly of nurses' knowledge and skill as nurses spent more time with the patient and stands at front line of care than other health care providers. It is the holistic and critical care of lifesaving practices of nurses in this unit within 24 hours after surgery (the most critical and essential time) such as hemodynamic stabilization, monitoring bleeding, assess and manage vital signs, fluid intake and output, with appropriate investigations consideration and collecting the results on time (18, 19).

Because there is a limited studies related to nurse's care in post-cardiac surgery ICU in Ethiopia, lack of necessary data about nurses care practice was making challenge for improvement, any correction, and advancing care for better patient survival. Thus, this study aimed at assessing post-anesthesia nurse's care practice and associated factors for patients underwent open heart surgery.

1.2. STATEMENT OF THE PROBLEM

In different countries of the world post cardiac surgery patients' care was unsatisfactory comparing to the standard of care (8). open heart surgeries related complications and death outcomes are the major death burden worldwide, by which most of it (80%) is among low and middle income countries including Ethiopia with inadequate nurses' care practice (5). When post cardiac surgery complications treated quickly and appropriately with standard nurses' care near to 80% of it can end with patient discharge to survival (20, 21).

An immediate post-anesthesia care in ICU is the critical and with major risks, it needs attention and quality nurse's care. Postoperatively, if nurses working there are incapable of adhering to postoperative cardiac surgery cares and unable to maintain the standard post cardiac surgery care, it will end with more complications, increased ICU length of stay, catastrophic expenditure, increased morbidity and mortality and unfruitful efforts of care providers (22-24).

Even though, the surgical procedure was performed perfectly with all necessary devices and technologies, it will not end with good outcome if proper nursing care practice is not applied. Whether it is a short-term training mode like basic life support, advanced cardiac life support or full professional training as cardiac nurse practitioner is a mandatory for standardized cardiac surgery ICU care (23)

Even though, studies found that cardiac surgical procedures were performed in good manner, using all necessary devices and technologies, it will not end with good result in the absences of good nursing care practice. Besides, patient after open heart surgery presents with critical clinical problems which seek nurses' frequent follow up, based on knowledge and skill of post open cardiac surgery nursing care. In addition there is scarcity of studies regarding post open heart surgery care practice status among nurses in Ethiopia.

1.3. RATIONALE OF THE STUDY

Since there are limited studies that identified and addressed the effect of nurse's practice on outcome of post cardiac surgery, this study will benefit the community as it identifies the gap of ICU care to end with quality care. The nurses working in the ICU will also benefit from this study as this can provide information on difficulties that they were facing during their stay in post-cardiac surgery ICU through which their organization will try to solve such difficulties and challenges. For an organization this study identified gaps or all challenges their staff nurses suffered from then they will benefit from any corrections they will make according to the finding which increase their organization service necessities. Further the organization and any institutions which have training program will be beneficiary of the study if they make aggressive measures according to the results after this study because quality care will increase recommendation for their further organizational achievements. Interested researchers with this study area and subjects will get a baseline data for further investigations.

2. LITERATURE REVIEW

2.1. POST-CARDIAC SURGERY NURSES' CARE PRACTICE

The literature review mainly focuses on level of practice of nurses at post cardiac surgery ICU and associated factors towards their performance. Out of 11.5% total CVD in USA about 600,000 surgeries were needed and similarly about 25% of 40,000 children with CVD need surgical intervention as a management of the diseases. Slightly more than half of cardiac surgeries in USA were cardiac bypass surgery. After these all surgeries the need of standard nurses' care is of crucial and mandatory (14).

A report from society of thoracic surgeons national cardiac surgeries database indicated, during 1994 – 1997 the post cardiac surgery complications related with different types of surgeries including death within 30 days of surgery related to surgery complications, poor post-operative nurses' cares and management were 4% of atro-ventricular replacement (AVR) surgeries, 6% of mitral valve replacement surgeries (MVR) and 12.6% of CABG surgeries (31).

A report showed some sub-Saharan Africa countries data on mortality related to cardiovascular surgeries. According to data on cardiovascular disease in Africa, 4.7% valve surgery related mortality of Ruanda, 6.7% RHD valve surgery related of Cote D'Ivoire, and 7.1% related to CABG surgeries of south Africa were due to intra operative and postoperative poor care provision of the respective health care providers (10, 15, 33).

In Ethiopia during 2017 -2021 study identified 4.1% of mortality related to all types of surgeries (26). In similar study the other types of surgeries done were include; 11.3% of CABG with 9.1% mortality related to it. Inadequate nurses' care practice during perioperative period is majorly responsible for these all complications and death events related to cardiac surgeries (26).

Different studies deal with nursing performance regarding ICU care after any types of cardiac surgeries (29, 30). A study done in brazil to evaluate post cardiac surgery nursing practice concluded that nursing care is utmost important care because it is a nurse who to plan and organize post cardiac surgery cares to ensure the patient with full recovery via activities such as prevent risk of infection, skin integrity and temperature monitoring, cardiac monitoring and maintain body stabilization (34).

The impact of poor nursing care during and after cardiac surgery extended to economic crisis due to extravagancy made. One study on coronary artery bypass grafting surgery identified that, \$62,773 for mediastinitis, \$49,128 for renal failure, \$40,704 for prolonged ventilation, \$34,144 for postoperative stroke, \$20,000 for considered reoperation, \$2744 for AF, 35-45 billion per year for Hospital acquired infections (HAIs) and 6% of mortality with 17 days additional stay in hospital was an unnecessary costs after in appropriate postoperative nurses care of cardiac surgery (17, 35, 36).

Length of stay following post cardiac surgery depends on nurses' care following surgeries by which most of comorbidity, complications and mortality were manageable by standard and proper post-operative nurses'. A prospective cross-sectional study done by 2021 in cardiac center Ethiopia showed that, half (51%) of the patients were found with long length of stay related with postoperative bleeding and number of surgeries performed at the same day. Here, postoperative bleeding and depression were the major complications happened with proportion of 19% and 1.2% respectively. These complications could be manageable with standard qualified nurses' care (27).

Other study done in Zagazig hospital by 2020 assessing practice regarding CABG surgery showed that, the overall nurse's practice in cardiovascular ICU was inadequate (17.5%). In contrast to this, the study in Egypt among post cardiac surgery nurses revealed that more than half (63.9%) of study participants had a total satisfactory practice regarding their performance in cardiac ICU (8).

Over all nurses care in cardiac surgery for whatever cardiac surgeries was inadequate. According to descriptive study in Guwahati Assam more than half (58%) nurses at cardiac surgery ICU had moderately adequate practice (39). The Pakistan studies on 2011 and 2017 to assess knowledge and practice of fluid administration among cardiac surgery patients showed that nurses had a poor practice level regarding fluid and electrolytes management (30). Similarly, another study in Pakistan to assess care after cardiac catheterization also revealed that almost all (87.1%) of nurses had unsatisfactory practice regarding post cardiac catheterization (37).

2.2. FACTORS AFFECTING POST-CARDIAC SURGERY ICU NURSES' CARE PRACTICE

According to study done in Egypt identified; nurse related factors (10%), patient related factors (10%), and work related factors (38.5%) were the main factors affecting nurses' practice in post

cardiac surgery intensive care unit. Similarly as study in Assam showed, knowledge and practice level of nurses' have positive (0.99) relationship (30).

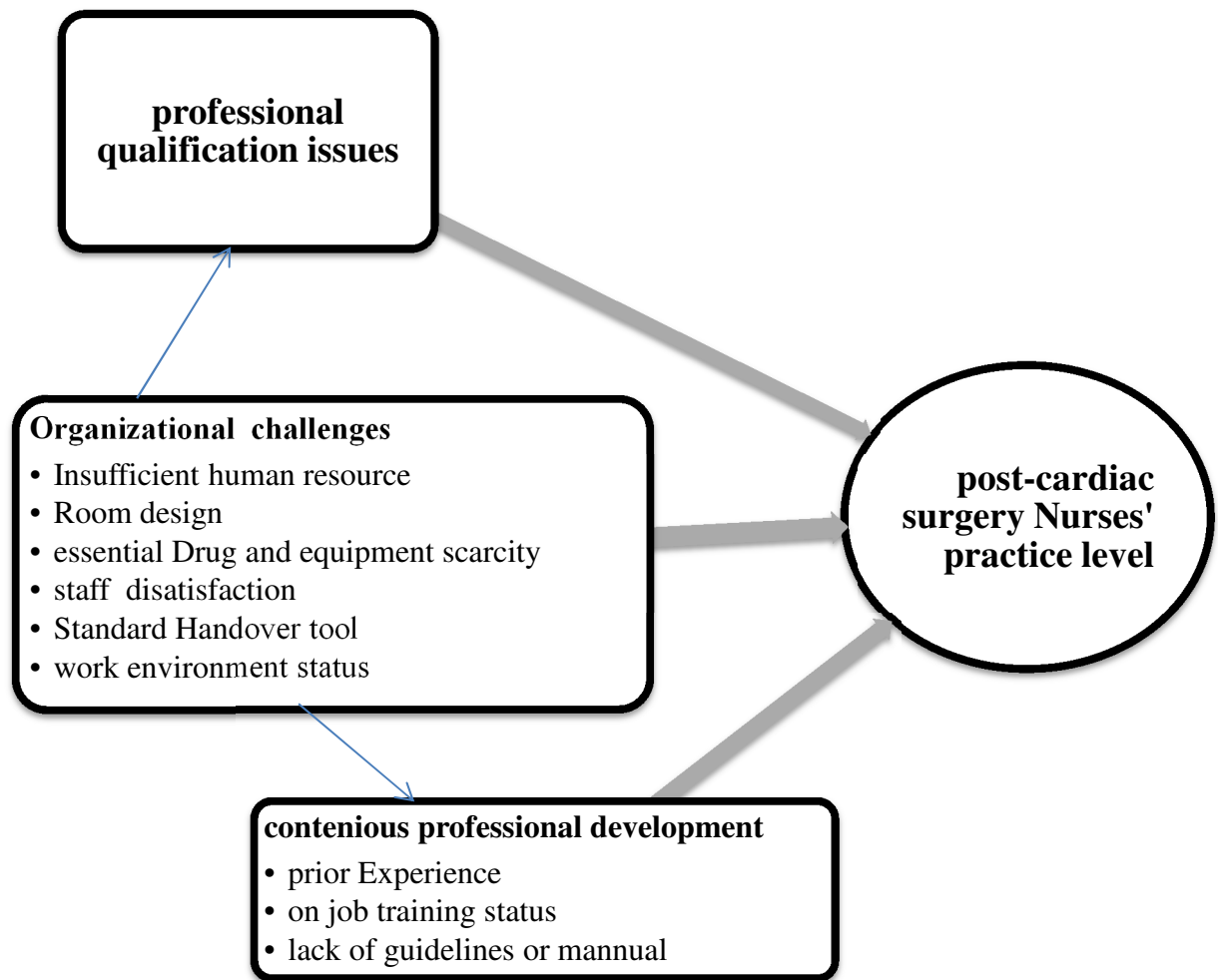
A Canadian study done to assess post cardiac surgery atrial fibrillation outcome, registered nurse understaffing as a main cause of this post cardiac surgery complication, while that of German done in 2017 revealed establishing of intermediate intensive care unit with specialized nurse staffs for cardiac surgeries had a great impact for decreasing post cardiac surgeries complication and shorten ICU length of stay (28).

Different studies identified knowledge and attitude of nurses working in cardiac surgery ICU affects the practice of nurses working in cardiac surgery ICU. a study conducted in Iraq, Thiqr government in 2021 determined level of knowledge difference significantly affected nurses' practice toward post cardiac surgery patient care (25, 38).

Nurses' knowledge and skill level in post-anesthesia care unit related with nurses' practice in cardiac surgery ICU. In Asia Assam, by 2020 majority of the nurses fall in moderately adequate knowledge while; only 3% of them had poor knowledge. The study tried to assess the knowledge level of post cardiac surgery nurses in Pakistan was determined the low knowledge level status of nurses affected the nurses' practice in post-cardiac surgery (30, 38)

Factors such as staff cooperation, nurses' self-confidences, clear and detailed doctor order, accurate drug prescription, daily work pressure, nurses' job satisfaction, importance of nurses' role, educational level of nurses, working experience as general and in cardiac units of nurses, cardiac related training status, nurses' sufficient experiences, innovative nursing care, convenience of medication store place, were identified as factors associated with practice or performance of nurse during post cardiac surgery (38).

CONCEPTUAL FRAME WORK



PCS-ICU = post cardiac surgery intensive unit, PCS-NC = post cardiac surgery nursing care

Figure 1 conceptual framework nurses' care practice and associated factors after open heart surgery in cardiac centers, Addis Ababa, Ethiopia 2023 (31, 33, 35, 36).

3. OBJECTIVES

3.1. GENERAL OBJECTIVE

Post-Cardiac Surgery Nurses' care Practice for patients Underwent Open Heart Surgery and Associated Factors in Selected Cardiac Centers Addis Ababa, Ethiopia 2023.

3.2. SPECIFIC OBJECTIVES

- To assess Post-Cardiac Surgery Intensive Care Unit Nurses' care Practice for patients underwent Open Heart Surgery in selected Cardiac Centers Addis Ababa Ethiopia
- To identify factors associated with Post-cardiac surgeries Care for patient underwent Open Heart Surgery in selected Cardiac Centers Addis Ababa Ethiopia.

4. METHODS AND MATERIALS

4.1. STUDY SETTING

The study was conducted in cardiac surgery ICU of Cardiac Centre Ethiopia and TAZMA medical and surgical specialized center found in Addis Ababa. These two cardiac centers were selected because they were providing full package of cardiac surgeries mostly open heart surgery services with separate post-cardiac surgery ICU equipped with essential drugs, supplies and nurses team. Cardiac center Ethiopia is a local NGO which is well-equipped and the first cardiac center in a Ethiopia having ICU with 10 beds, 21 nurse staffs and other specialized clinical staffs related to the service the department was giving and Tazma medical surgical specialized center is a private health facility with equivalent service with CCE which have cardiac surgery ICU with three beds, 13 ICU nurse staffs.

4.2. STUDY PERIOD

The study was conducted for two months of duration starting from March 1, 2023 to May 30, 2023.

4.3. STUDY DESIGN

Mixed method employed. Descriptive explanatory qualitative study design was employed to meet the objective of the study.

4.4. STUDY POPULATION

Source population

All nurses working in ICU in selected cardiac unit were used as a source population for the study.

Study subjects

Nurses working in cardiac surgery intensive care unit of selected hospitals

Eligibility criterion

Inclusion criteria: those nurses assigned and working in cardiac surgery ICU and stayed there for the entire period of data collection and who were interested to participate were included regardless of their educational status.

4.5. SAMPLE SIZE DETERMINATION

Because purposive sampling is a widely used technique in qualitative research, we recruited 34 staff nurses from selected study area working in cardiac surgery ICU, believed to be rich of information about point of interest. All recruited staff nurses were permanently employed and were assigned in cardiac surgery ICU during the entire period of data collection.

4.6. SAMPLING PROCEDURE

By purposive sampling both study areas and study subjects were selected. From all hospitals found in the Addis Ababa two cardiac centers; cardiac center Ethiopian, TAZMA medical and surgical center that were providing open heart surgery service were included. These both centers were selected because both of them were providing full service of open heart surgeries and have functional and separate post-cardiac surgery ICU with nurses working there at the entire time of data collection for meet the objective of the study.

4.7. MEASUREMENT

4.7.1. Study variables

Dependent variable: post-cardiac surgery nurses' care practice level.

Independent variables: independent variables includes; socio-demographic status of nurses, organizational structure and infrastructures; ICU design, management style, resource availability, workload, qualification and training, training, availability of guidelines, skilled human power, and team related variables: communication, respect to each other, and clarity of documentation.

4.7.2. Instruments

Three tools; structured questionnaire, observation checklist, and in-depth-interview with semi-structured questionnaire as interview guide were used.

Tool-1: structured questionnaire contains: socio-demographic variables of the nurses; age, monthly income, sex, current working institution, educational level, marital status, health status, years of

service as a nurse, experience in cardiac surgery ICU, and training related to cardiovascular issues and professional qualification.

Tool-2: observation checklist to assess practice level containing about 65 activities including, pre arrival, patient arrival, initial assessment & care and ongoing assessment and care.

Tool – 3: In-depth-interview: guideline with possible probing was used to assess their practice and challenges in cardiac surgery ICU. The core questions/guidelines for interview were: 1. Describe your experiences with patient care in the postoperative period of open heart surgery, 2. What difficulties can nurses encounter during caring for the patient in the postoperative open heart surgery period, when starting activities in the ICU? 3. Which difficulties a nurse can find even working longer in the cardiovascular ICU, and 4. How do you explain the moment the patient arrives at the ICU after open heart surgery?

4.8. DATA COLLECTION AND PROCEDURE

Socio-demographic variables of the study participants were collected with structured questionnaire. Participatory observation with checklist used for nurses; activities. Following immediate postoperative period the data collectors were ready enough to fill the checklist accurately and appropriately standing at a very visible and comfortable point of view. First a primary nurse who prepared receive the patient was identified. Then the observer started observation from pre preparation without any disturbance made and not made them let they knew were under observation. The data collectors were stayed there until the noted practices were completely observed; one hr. for immediate care activities and up to three hours for secondary/ongoing care activities. The in-depth-interview complemented with field notes was conducted with audio-record until data saturation at a separate and free space at the time comfortable to them.

4.9. OPERATIONAL DEFINITIONS

Cardiac surgery ICU: is the unit where patients who underwent open heart surgery were receiving nurses' care immediately after surgery till patient conditions get stabilized.

Post-cardiac surgery nurses' care Practice level: according to this study it is the care nurses could provide for patients who underwent open heart surgery at cardiac surgery ICU post operatively. It was measured with observation checklist. Those who do the activities were coded as '0' while those were not as '1'.

Inadequate Practice: those who scored less than mean value. ($97.4 \pm 7.7SD$)

Adequate Practice for those scored above mean value. ($(97.4 \pm 7.7SD)$)

4.10. DATA QUALITY CONTROL AND MANAGEMENT

The quality of data was maintained by proper designing, and pre-testing. All questionnaire prepared in local language in addition to English and checklists is prepared with English language Two data collectors and one supervisor Bachelor Science nurses, with previous experience on qualitative data collection and supervisory skill were recruited. Training was provided by principal investigator on the objective of the study, study methods and materials, ethical issues.. The audio record was complimented with field note to include the verbal and non-verbal behaviors of the participants as they occur and also to facilitate for probing of more answers about the issue. Daily reviewing and understanding of the recorded interview by the supervisors and principal investigator was made and the necessary feedback was provided back to the interviewers. During observation the participants were not made to let know they were under observation. This avoids the alteration of subjects' behavior due to their awareness of being observed.

As trustworthiness is mandatory to have a trust between reader of the research and the work of the researcher, we were demonstrated. To ensure Dependability (the study tools audit was done by a person outside of the study group), Conformability (to overcome the overlapping of themes and avoid researcher based bias; researcher evaluate himself for the data abuse of his perception and beliefs affect or not the data), Transferability (dense description of the process) reflective notes immediately after each interview was written and peer debriefing for credibility.

4.11. DATA ANALYSIS PLAN AND PROCEDURES

Quantitative data were cleaned, coded and entered to Epi Info 7 software, then transferred to SPSS version 27 software. Continuous data were described in terms of mean and standard deviation. All audio recorded interviews were fully transcribed none verbatim in the language of the interview made and translated to English for coding purpose. Open coding was used to assign captions to transcripts segment from codes which contain similar concepts. Sub-themes were developed from open codes and then final themes were developed and analyzed thematically using the inductive approach and narrated supplementing with field notes. The results were presented in the form of tables, figures, and narration.

4.12. ETHICAL CONSIDERATION

Research Ethical approval was obtained from the research ethics committee of the St. Paul's Hospital Millennium Medical College and Permission to conduct the study was obtained from city administrations health bureau then to the study hospitals. Consent obtained from all study participants prior to data collection interview started. Written information explaining about purpose of the study, their rights to refuse or stop at any stage of interview and data confidentiality were provided.

4.13. DISSEMINATION PLAN

The result of the final thesis will be presented and submitted to SPHMMC and school of nursing. The findings will be distributed to the study hospitals and city administration Health bureau. There will be interest to publish the finding in scientific and peer reviewed journal and wishing to present the result on different public conferences.

5. RESULT

5.1. Socio-demographic of Staff Nurses

Response rate was 100%. All of study participants are female in gender and their age ranges in between 20 – 30 years with mean age of 25.7 ± 2.2 years with 61.8% of them were single. In terms of qualification 14.7% had level IV and 73.5% bachelor degree holders. The mean experience of the nurses as a nurse was 3.26 ± 1.69 years with range of experience between 1 – 8 years. Mean experience of cardiac surgery ICU was 2.38 ± 1.457 with range between 1 – 6 years. Only 26.5% of the study participants had training related to cardiac diseases and management (Table 1).

Table 1 sociodemographic distribution of study nurses in selected cardiac centers Addis Ababa Ethiopia 2023

Variables	Categories	frequency	percent	total
Training	Yes	9	26.5	
	No	25	73.5	
cardiac surgery ICU experience	1	11	32.4	
	2	11	32.4	
	3	6	17.6	
	4	2	5.9	
	5	2	5.9	
	6	2	5.9	
	Mean $\pm$ SD	2.38 ± 1.457		
EXPERIENCE AS A NURSE	1	4	11.8	
	2	6	17.6	
	3	14	41.2	
	4	5	14.7	
	5	1	2.9	
	6	1	2.9	
	7	2	5.9	
	8	1	2.9	
	Mean $\pm$ SD	3.26 ± 1.69		
Education status	1. level	5	14.7	
	2. BSc n	25	73.5	
	3. OR nurse	2	5.9	
	5. master	1	2.9	
	6. cardiac nurse	1	2.9	
Monthly income	4000	2	5.9	
	5000	3	8.8	
	7000	12	35.3	
	7743	1	2.9	
	7744	1	2.9	
	8000	15	44.1	
Marital status	Single	21	61.8	
	Married	13	38.2	

5.2. Level of Nurses' Care Practice

As noted from both checklists statistical analysis and direct observation made nurses' practice both at initial phase and ongoing phase was in adequate. It was identified that nurses' care for patients underwent open heart surgery was practiced inadequately among 62% of staff nurses in cardiac intensive care unit. (Figure (3) Nurse Staffs who had less than three years of experience in cardiac surgery intensive care unit were in adequately practiced post-open heart surgery patient cares.

In this study post-anesthesia nurses' care practices were observed and grouped as: 1. Initial post-operative activities; before patient arrival, at patient arrival, initial assessments, and initial cares and 2. Ongoing postoperative nurses' activities; ongoing assessment, ongoing cares. Thus they did not achieved 88.9% of ongoing care and 61.8% of initial nurses' activities; indicating almost cares to be provided were inadequate for post anesthesia care good patient outcome. (Table 2)

Starting at the beginning they most of them (58.8%) failed to do machines and drugs preparation prior to patient arrival at ICU independently, rather they did such activities by asking each other even though informally in between their individually assigned role. Here they mentioned they were not familiar with manipulation of machineries and preparation of drugs as per the need of coming patient. However those who had exposures and related training were waiting for patient with full preparation by referring the intraoperative orders and status of the patient. (Table 2)

Immediately after surgery it was seen as a time where all team especially ICU nurses were getting busy of caring for patient at risk and unstable due to anesthesia and intraoperative surgical effects. All the room staff nurses were gets ready of receiving the patient though there was one primarily assigned nurse to receive the patient from surgery team. To receive the patient even though hand-over tool is mandatory no utilization of this tool at all among all study participants. Among most of them they simply received the patient with only oral communication among anesthesia and OR surgery teams. They suggested that, even though they believe by hand-over tool utilization to avoid many confusions on patient care still not applied. Most of them put this problem as they were not told to do so and no body brought the tool to the room.

Oh! We don't now such kind of trend we simply receive the patient with oral talk, no one thought and told to use such tool, though I believe that it is good and simplify means of communication and end with no confusion about the patient, this was not known as much ... here most of standards are tried in applying but this still not.... (Interview106)

This is a good idea to use such tool, but no one had remembering about it, even there are lack of main machines and equipment what you are talking! This simple tool...? I think it is good to use but still not applied. (Interview202)

Table 2 status of cardiac surgery nurses' care practice at different stages in cardiac centers, Addis Ababa Ethiopia 2023

	Nurses' practice categories	Status	
Initial nurses' activities		Adequate	Inadequate
	Before patient arrival	14 (41.2%)	20 (58.8%)
	At patient arrival	14 (41.2%)	20 (58.8%)
	Initial assessments	21 (61.8%)	13 (38.2%)
	Initial cares	13 (38.2%)	21 (61.8%)
<i>Total initial activities</i>		13 (38.2%)	21 (61.8%)
Ongoing nurses' activities			
	Ongoing assessment	27 (79.4%)	7 (20.6%)
	Ongoing cares	12 (35.3%)	22 (64.7%)
<i>Total ongoing/secondary/activities</i>		15 (44.1%)	19 (88.9%)

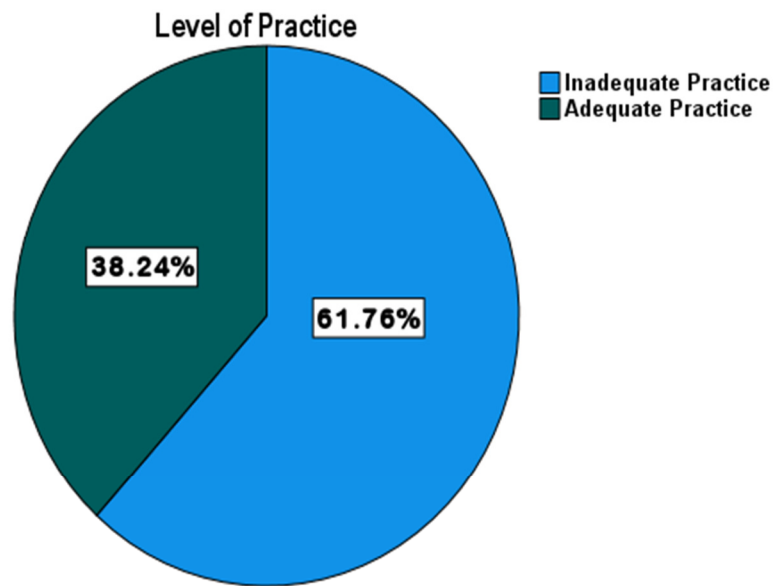


Figure 2 nurse care practice among patients underwent open heart surgery in selected cardiac centers Addis Ababa Ethiopia, 2023

Table 3 sample of post-anesthesia nurses' care practice activities for nurses in selected cardiac centers Addis Ababa Ethiopia, 2023

Nursing activities	Done	Not done
Check for catheter	1 (2.9%)	33 (97.1%)
Measure urine output	1 (2.9%)	33 (97.1%)
Obtain ABG	24 (70.6%)	10 (29.4%)
Make all necessary drugs ready	21 (61.8%)	13 (38.2%)
Note types and doses of narcotic and relaxants	2 (5.9%)	32 (94.1%)
Check chest tube	4 (11.8)	30 (88.2%)
Check color and amount of drainage	10 (29.4)	24 (70.6%)
check heart rate and rhythm	17 (50%)	17 (50%)
Check peripheral pulse	2 (5.9%)	32 (94.1%)
Make bilateral auscultation	13 (38.2%)	21 (61.8%)
Check motor response	0	34 (100%)
Peripheral temperature and skin color	2 (5.9%)	32 (94.1%)
Assess pain status	3 (8.8%)	31 (91.2%)
Assess for weight	0	34 (100%)
check pupil dilation	0	34 (100%)

5.3. Factors Affecting post-Cardiac Surgery ICU Nurses' Level of Practice

For factors affecting nurses' care practice in cardiac surgery ICU analysis; three themes with seven sub-themes were developed after in-depth interview: professional qualification related challenges; difference in qualification and limited cardiac setup related specialty, work organization challenges; limited human resource, disorganized ICU room, managing and supervising problems, and continuous professional development related challenges; on job training, experience of nurses as the major factors associated with post-anesthesia nurses' care practice for patients underwent open heart surgery. (Table 4)

5.2.1. Professional qualification Issues

During interview it was noted that professional qualification status in terms of difference in qualification and limited specialty nurse qualification related to specific area associated with nurses' practice there. This was because nurses without such specialty lacked a basic knowledge and skill on how to manage the critical patient in post anesthesia unit properly and on time.

In the study areas the number of professionals related to cardiac care is very rare. Mostly the unit was occupied with Bachelor nurses and level IV nursing certified. The deficit of professional qualification in cardiac surgery ICU environment as a whole in the country have been seen as the critical challenge for poor patient health outcome. Participants mentioned that because they were not qualified with specific care they were in confusion the entire time patient taken off OR to ICU. Some of them believed that specialty in critical care; cardiac care, anesthetics and any related profession with cardiac were a pre required criterion for cardiac surgery ICU work.

It is obvious that, here in cardiac surgery intensive care unit there is no common knowledge among all staffs; we all have different skill and abilities toward the standard of care for cardiac patient, actually we are nurse in profession but not related qualification for cardiac patient care; then it made difficulties to care for this room patients as per need, ok? (interview108)

Having different level of education among study participants thought to be a challenger toward standard care. Participants suggested the demand for more skillful and knowledgeable nurses with similar qualification to avoid confusion made in care provision among differently qualified staff nurses. They reported that, all nurses thought differently and tried to apply the care as they went

rather than making a common sense because their way of understanding and knowledge and skill level was significantly make a difference. Being an expert nurse in cardiac surgery ICU is empathic, warm, adaptable, and fast enough to provide care in a manner of 'blink of eye' in ICU.

As you also know professionals with different qualification have different strengthen and weakness on qualification and further on what they are not qualified with assume what kind of disparities can be seen? ...big difference in skill, in knowledge, etc. therefore I guess that this qualification difference is a major cause of different in understanding and application of the standard. That is all about... (Interview205)

Table 4 data extract for theme development

Data extract	Codes	Sub-theme	Theme
<i>"...it is amazing! not the matter of qualification and specialization, general nurse assigned here is also not satisfactory to make difference on cardiac patient care post-operatively, no rest at all because here patients are critical and need continuous follow up, checking respiration, drainage, heart profile, machinery follow up etc. all put the patient at risk if not followed, but is good here is there is team work all are ready to do whatever in the room"</i> <i>Here no sufficient qualification, no sufficient human power to meet the need of ICU patient cares; we are doing both at main ICU and here in special ICU. It was very boring to go up on the next floor and again step down This is in addition to moving here and there to bring and return back limited machines and equipment, you see the how much it is difficult?"</i> <i>Because care provision in this room is a status of patient between death and life, it made you very confused and stressed; sometimes we also fall in coma either from stress or tiring of fast and uninterrupted care here.</i>	Work overload, dependency, unmatch work and number of nurses, Job satisfaction issues, critical patient ,immediate and fast care needed, tired of work, uninterrupted attention seeking care,	Inadequate human power, managing and controlling system Disorganized work environment	organizational challenges
<i>In this ICU we all are graduate if different institutions with different professional qualification. Example I am level IV nurse, and what I am doing here and I had studied is very far away; my qualification doesn't fit enough I am looking at others until I develop enough experience.</i> <i>It was expecting that we can do any nurse care wherever in this hospital since we are a nurse, but this room need any specialty related to the setting and again also there is a big difference in ways of understanding, knowledge level, and skill as we are collection of different qualification</i>	Graduating in different qualification, having different knowledge and skill, need of specialty	Difference in qualification Lack of specialty nurse in line with cardiac issues	Professional qualification issues
<i>I was assigned here directly after my completion of level of education. I did not worked else were beside my clinical internship during student. In this setup it was challenging to act nurses' care without any updated information and orientation related to cardiac disease and surgery</i> <i>All machines, drugs administration, and a lot of protocols are different from other ICU or ward care. Not only knowledge of nursing care, this all machines used to maintain patient health are mostly manipulate by nurses here; here if you are not have any information, guideline, training or experience how it is possible bro?</i> <i>Here I did not got any new thing about cares in this room, I simply looking and working what understand or not; which was causing poor patient outcome</i>	working without prior exposure, skill gaps, poor patient outcome Lack of orientations, guidelines,	Lack of on job training Lack of experience in cardiac surgery ICU	Lack of Contentious Professional development



Figure 3-diagram showing the themes relationship; work organization system status is inclusive of other factors affecting nurses' care practice in ICU as it also deals with human power recruiting and upgrading the knowledge and skill of staff nurses

5.2.2. Organizational Related Challenges

Work organization structure or infrastructure was noted as a challenge toward nurses care provision in cardiac surgery ICU. participants mentioned that challenges related to disorganized ICU; room design (far away with major OR), limited essential (machines, drugs & equipment), lack conducive work environment, absence of guidelines or manuals, pure managing and supervising style; deficiency of human resource, staff dissatisfaction, unusual behavior development (carelessness and sense of dependency) ,a as the big difficulties presented toward nursing care practice. Arrangement of equipment and essential drugs to be used during immediate ICU care should be in a convenient state.

Disorganized post-Cardiac surgery ICU

Few of them stated that frequently used machines and drugs were aggregated at not at easily accessible place and again very far away from cardiac surgery intensive care unit.

In this unit, I don't now....it is very challenging as we are tired of searching and bringing/moving limited machines from here to main ICU, then ward and elsewhere in this company, for example here this EKG machine is the only properly functioning machine... therefore how can I tell you how much it is boring to give appropriate patient care with such challenges. (Interview 203)

Though activities like; assessing of heart rate and rhythm, blood pressure, hemodynamic profile, neurologic status, collecting lab results, EKG, chest X-ray, temperature, chest drainage, urine output-input, heart filling pressures are the most characters showing the status of post open heart surgery patients' status, most of nurses failed to achieve these. (Table 3)

AS you are seeing now physically we are here to serve the patient, but, but, but there are a lot of scarcities; machineries scarcity, un equal level of understanding, individual problems, etc.... running here and there to search for machines, equipment, drugs, ...whatever it is things are full of challenges and difficulties for properly applying my responsibility on this unit nurses' activities (Interview204)

Sometimes limitation of essential drugs and equipment was seen in the setting of study areas. Even though this is related with poor supply as whole country, lack of prior purchasing and fail in predicting of future problems to happen were seen as factors affecting nurses' care plan for patients underwent open cardiac surgery. These were related to poor management or leadership status within the organization as all of these problems were the mandate of senior management team of the organization and supervision body.

“Suddenly the unit lack essential equipment and materials with drugs to run the activities within the unit not according to the standard, as a simple and easy patient care. I remember before ... I think before six months back open-heart surgeries totally stopped for few months until materials purchased; centrally management problem. So, let you think how it is possible without sufficiently equipped? ... Even one single material can have effect” (Interview103)

Poor managing and supervision style

The study area participants mentioned that lack of clearly identified job responsibility in post cardiac surgery patient care as a critical problem to apply the standard patient care. They reported as immediate post operatively all clinical professionals were participating in the patient care for good patient outcome. This means that they were not working depending on job description and simply they do what they thought is right and good in addition to what they are told to do by others.

We are working together, as you have seen before a minute, all are running here and there then I get confused what to do and how to do. This make a little delay in care sometimes and then care started, so clear responsibility what, when, and who to do is mandatory Yea?” (Interview101)

Beside lack of enough specialty nurses profession in study area as a factor for proper cardiac surgery ICU care provision, in sufficient human power to meet the minimum care requirement is also the other major factor. Respondents reported that even though cardiac surgery ICU is the unit where much work load exists and need restless effort to increase patient survival, the staff nurse assigned was not fair. Over work assignment ends with both physical and mental tiredness and moral decline. Cardiac surgery ICU is an area where fast acting, memorizing, and being oriented are main duties of nurses there it need related profession for best outcome.

“...it is amazing! not only a matter of qualification and specialization, general nurse assigned here is also not satisfactory to make difference on cardiac patient care post-operatively, no rest at all because here patients are critical and need continuous follow up, checking respiration, drainage, heart profile, machinery follow up etc. all put the patient at risk if not followed, but is good here is there is team work all are ready to do whatever in the room” (Interview 107)

Here no sufficient qualification, no sufficient human power to meet the need of ICU patient cares; we are doing both at main ICU and here in special ICU. It was very boring to go up on the next floor and again step down This is in addition to moving here and there to bring and return back limited machines and equipment, you see the how much it is difficult?”(Interview204)

It was seen that some of nurses were careless, and lack full attention toward the work in the unit through the patient receiving to ongoing patient care. Because there was a trend of helping each other among cardiac surgery ICU nurses dependency on each other was commonly observed individual nurses behavior. Again also as per the participants report there are individuals who were being there simply to fulfill criteria of employment. Such individuals are the big challenge for proper nursing care both for themselves and their colleagues.

“Some of assigned nurses don’t take duties here as serious and critical point, simply because they were assigned here, they tried to do or help others. I guess such attitude can hinder the full delivery of post-operative nurse care practice.” (Interview206)

“There are individuals seen as careless and fail to make skilled communication. Such individuals are either knows what do or try to know what to do by cooperating with other staffs. Anyways we all are with different characters that made us perform something differently or poorly.” (Interview201)

Very loosed supervision and controlling system also seen as a factor for proper delivery of expected responsibility. Since immediate post cardiac surgery care is over lined and need a fast uninterrupted care provision it was obvious to made staff nurses there anxious or stressful. This problem hidden under nurses shinning in the room as poor supervision and control system was responsible to expose this condition. This can made a burden on others and made them stayed without any change of care provision.

“It is full of anxiety, helping unconscious patient made us also unconscious ...hhhh yea it is very difficult to provide care for the patient status between deaths and live, especially among non-experienced nurses.” (Interview 105)

“Team work is good culture of work, it increases quality health care but for some individuals it affects badly as they develop addiction as addicting toward coffee, or any other addictive. Oh! It is amazing; those are not trying to do by themselves rather asking and ordering others. In short this made in appropriate delivery of our care provision, you got me? Yea” (Interview 102)

The unsatisfying working environment and payment status was also reported as the factor affecting the ICU staff nurses to apply standard and quality nurses’ care in the room postoperatively. They

mentioned that even though they were working tirelessly and committedly there were no any motivation measures in any kind taken.

“Here... only expecting from us, no any satisfying measures from senior management, we are only waiting for this not more than 5000 salaries...” (Interview 202)

5.2.3. Lack of contentious professional development strategies

Lack of on job training

Participants mentioned that in adequate staff training made for related setting, lack of plan to train the staff nurses, was remained the main challenges to deliver standard patient care in cardiac surgery ICU. It is mandatory to had updated information on skill and knowledge of cardiac surgery related issues. Both checklist and interviewed participants report indicates only few of them had trained on one or two topics which are not satisfactory both in content and number of individuals trained. The participants suggested that it was easy to make a difference in care and end with best patient survival if all are trained of drug administration, machinery operating, physiology and pathophysiology of the heart and frequent experience sharing strategies from other similar institutions whether nationally or internationally.

“Training, training, training again training and experience are mandatory. Here we are assigned here after graduation no training even any bed side guidance, we started care after graduation for the first time here. I made others bored by asking everything daily, since it is special care and difficult to catch a single drug name soon.” (Interview 205)

Lack of prior experience

If no enough experience, managing the patient with appropriate protocol and handling of any complications and drug side effects, as well as manipulating machines (ventilators, suctioning, adjusting or setting of machines as per needed) in the setup is very difficult. It was noted when nurses who have been told to do an indicated machines use they were searching for help of others instead of doing by themselves; result with delayed patient care. Staff nurses in ICU stated that, when difficulties increasing in the room, the full package of care to be provided were uncertain, mistakes could occur continuously, and work load on few individuals can happened. Again unavailability of

any type of guideline in their room was the other deficiency challenging to update their knowledge and skill towards standard nursing care.

“example if I don’t know how and how much dose of heparin and ant pains it can put this already at risk patient coming from OR. I came here one year back, ... still no new things, I am sure this is mostly affecting our work here and now new assigned should get trained with most common points and previously assigned nurse for new updates and so on ok!” (Interview205)

“We were working with the help of culture of helping each other rather than teaching and training each other and again training by the organization. If you have experience and training you can handle all duties easily. So, what can neither experienced nor trained staff nurse do? Simply suffering from stress” (interview 104)

In summary from both observation and interview made we identified that the practice level of nurses in cardiac surgery ICU was inadequate. this study identified that these inadequacies were due to work organization condition challenges; in sufficient human power, disorganized cardiac surgery ICU work environment (scarcity of essential drugs, machines and equipment), poor managing and supervising style (staff dissatisfaction, trend of dependency, absence of job description), professional qualification related challenges (difference in profession, less cardiac care related specialty), inadequate continuous professional development (on job training and work experience in cardiac surgery). Among all challenges organizational challenges especially poor managing and supervision were responsible for all other challenges. Because scarcity of supplies, shortage both in qualification and number of human resource, lack of staff training and recruiting of experienced nurses are all on the hand of organization management.

6. DISCUSSION

Nursing care in post-cardiac surgery intensive care unit for patient underwent open heart surgery needs frequent, fast and skillful human resources. Thus, this study helps to determine the magnitude of post-anesthesia nurses care practice status and factors affecting to apply the standard care in the respective unit. Three themes; work organization condition challenges, continuous professional development after basic qualification, and professional qualification issues, were identified as factors effecting provision of standard care among cardiac surgery ICU nurses for patients undergoing open heart surgery.

In this study about two third of nurses did not attend any training related to cares in cardiac surgery ICU which is similar with study done in Pakistan among post cardiac catheterization nurses (30). Similarities may be related to nurses in previous study were priory qualified with the area relate specialty and no need of training as new staffs. Regarding work experience in cardiac surgery ICU most of participants have less than three years of experience. This is in contrast to study the above similar study by which most of them had greater than 10 years of experience in Cardiac surgery ICU. The difference is suggested to be the difference in professional qualification; as that of Pakistan's have right to be there because they were a qualified staffs (30).

The study determined that about 62% of nurses' care practice in cardiac surgery ICU was done inadequately. This indicated that most of study participants inadequately practiced throughout the initial care to secondary care. Other studies in Egypt done on post cardiac surgery nurses practice; two third of them had inadequate practice level and that of practice after cardiac catheterization; 87% of cares practiced inadequately (25, 28). It was also in line with studies done in zigzag among patients underwent CABG surgery; more than half of nurses had inadequate care practice (30) and also that of Pakistan done on nurses practice level after cardiac catheterization; 87% of them had inadequate practice level toward post cardiac catheterization care (39) Similarities are suggested to be due to similarity in study tools used to assess nurses' performance and study area.

.Catheter site checking immediately in ICU is the critical activity by which input and output, and kidney function can be detected. Nurses working in cardiac surgery ICU of the study area were failing to check catheter site during initial care of post-operative period. This is in line with study done in

Pakistan; near to half of study participants fail to check catheter site immediately after received to ICU. And again with the similar study 85.7% of cardiac surgery nurses cared for patients underwent cardiac catheterization did not check the peripheral pulse, which is consistent with current study; 94% of them did not similar nurses' activity (39).

Most of Nurses in ICU of the study area were inadequately practiced basic patient monitoring activities at initial phase of post-cardiac surgery nurses care including; obtaining cardiac profile, check thoracic drainage, neurologic assessment (no at all), assess pain status, collecting all laboratory requests and do arterial blood gas analysis.

Nasogastric tube check and care after cardiac surgery is of standard care to monitor the patient's respiratory competence. In this study more than half of them missed to check at time it was indicated to do so. Also other study done in Egypt identified similar result; 78.7% of them fail to check and care for nasogastric tube post operatively (39)

In addition to nurses' care practice this study helped us to identify difficulties toward cardiac surgery ICU nurses' care practice. The first theme of the result presented to highlight aspects related to the professional qualification among study nurses. Thus, the study subjects stated, the difference in professional qualification as a major factor affecting their care practice toward standard. This is similar with study done in Pakistan (38) and Egypt (28) among similar study participants. It is suggested the difference in Professional qualification can made difference in knowledge, skill and ways of understanding between individuals since the curriculum through they had thought is different in specific points of concern (38).

In this study organizational challenges; inadequate supply, insufficient nurses, poor managing and supervision, were related with complexity of care provision after open heart surgery. In addition to stressful environment of cardiac surgery ICU, searching for alternative drugs, collecting limited machines and equipment from far away room with a limited nursing team ends with compromised standard of care. Similar to these other studies in Egypt Cairo (28) and Rio Grande do sol (25) and Pakistan (38) with similar study subjects identified organizational inconvenience as critical factor for effective post-anesthesia nurses' care (25, 38).

Lack of experience and on job training affects patient health outcome after cardiac surgeries. This study identified presence or absence of training and lack of experience in cardiac surgery ICU could

affect nurses' practice towards the standards. Only few of study participants were trained on cardiac related issues and have more than five years of experience in cardiac surgery ICU. This is in line with studies of Egypt and Pakistan suggesting that similarity related to data collection and tools used among them (25, 38)

Good skill at monitoring devices and medication administration saves the patient from further complications and mortality (29). The study suggested more and more training and having of well experienced staff nurses can overcome such difficulties. Inability to manipulate machines and identify the indication, dose and side effects of drugs used there were the main challenges for nurses to act as a cardiac surgery intensive care unit nursing's team (30).

Participants defined the time of patient admission to ICU after open heart surgery as stressing, confusing and make anxious, leading them for not to provide safe and proper patient admission and immediate cares procedures. This is consistent with Cairo Egypt study suggesting similarities related with similarity in data collection tools (28).

Being unsatisfied with incentives and payment made for them was also listed as another factor leading to in adequate nursing practice in PCS ICU of study areas. They mentioned that even though they were working tirelessly and committedly there were no any motivation measures in any kind taken. Again, in availability of any type of guideline in their room other node challenging to update their knowledge and skill for adequate nursing care. This is similar with a narrative review don on routine post-operative care among adult cardiac surgical patients (40).

7. CONCLUSION

Individuals who qualified with post cardiac surgery nurses care as well as those who took training for what they were providing were very low in the study area. Because lack of area related nurse specialty the quality of care in the post-cardiac surgery intensive care unit was ending with patient poor outcome. Nurses 'care practice such as care patient arrival, at point of patient arrival, both initial and ongoing assessment care in cardiac surgery Intensive care unit for patients underwent open heart surgery was very inadequate. This inadequacy mainly related with professional qualification differences, lack of more specialized nurse in relation to the work unit, absence of on job training,

poor experience, deficiency in human power and infrastructure, poor managing style, and disorganized cardiac surgery ICU such as inadequate supply. Therefore, improving nurses' human resource both in number and qualification and in addition increasing the knowledge and skill gaps of cardiac intensive care unit nurse through on job training and increasing trend of experience sharing are crucial to overcome these factors. Good managerial and close supervision of the unit nurses working habit, putting appropriate and clear job description for staff nurses can improve the factors related with intensive care unit gaps. Good management and supervision style can manage unit related deficiencies such as drug and equipment supplies and able to make comfortable working zone for staff nurses. These all can improve the difficulties and deficiencies associated with post-cardiac surgery intensive care unit nurses' care practice level.

8. STRENGTHEN AND LIMITATIONS

This study utilized an observational checklist tool and in-depth interview which give overall general concept of cardiac surgery intensive care unit nurses' activities.

Since it is a qualitative study it presented the right perceptions and feelings of people of interest for this study. The finding helps the organizations and nurses to pay attention with gaps related to them for immediate correction targeted to standard care with good patient outcome. The study lacks to include knowledge level, pre-operative and intra-operative nurses' care practice thought perioperative care is interdependent activities.

The study included only nurse professionals, but if it had included all clinical professionals providing similar duties in the respected room the exact side of gap presented could be identified and enables comparison and generalizability.

9. RECOMMENDATION

Staff nurses should find for any ways of upgrading their qualification and on job training.

Preparing a module or guidelines related to post-anesthesia care should be considered either by staff nurses or administration body.

Concerned institutions should seek for strategies related to contentious professional development, related professional qualification, creation of guidelines, manuals and protocols, make a well-organized ICU work environment, well-equipped, provision of adequate human resource, motivational strategies; good managing style in cardiac surgery intensive care unit.

Higher institutions should works toward increasing number of cardiovascular nurse professionals and facilitate means through which continuous professional development can be achieved.

We recommend further research including knowledge level with practice level in large study area for generalizability of the problem. And also further study which is inclusive of all clinical staffs (anesthesiologists, duty physician, and cardiac surgeons) for comparability and generalizability of cares and gaps found in the cardiac surgery intensive care unit.

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APPENDIXS: TOOLS OF THE STUDY

APPENDIX I. INFORMED CONSENT FORM (ENGLISH VERSION)

Title of the research project: -Assessment of Nurses' care practice for patients underwent open heart surgery in post-cardiac surgery intensive care unit and Associated Factors in Selected Cardiac Centers, Addis Ababa, Ethiopia 2023.

Name of principal investigator: Lemma Fayyisaa

Name of the organization: St. Paul's hospital millennium medical college, school of nursing, department of operating theatre nursing. .

Introduction: - This information sheet is prepared for nurses working in post cardiac surgery ICU in Addis Ababa with aim of clearing up of the research project that you are asked to join by the group of research investigators.

Purpose of the Research Project:

The main aim of this research project is: To determine the practice and associated factors among nurses giving care for patient underwent cardiac surgery in ICU. This will result with useful information about the practice or care that assigned nurses at the department are performing and what will make them not to apply the appropriate post cardiac surgery care for the need of identifying the principal gap found there and suggest what to do for quality and standardized immediate postoperative care to decrease complications and preventable deaths.

To accomplish the project's main objective, we invite you to take part in our project. If you are interesting, you need to understand and sign the consent form. Then you will be asked for the questions and respond accordingly.

Risk and /or Discomfort

During this research project workup there may be some discomfort, especially on scarifying your time (to the maximum of 20-30 minutes) otherwise, no risk for your participation to the research

project. So that your response on this research will provide important results to show the gap in nurse care and finally it can help in improving the care to be given in postoperative ICU for patients undergoing cardiac surgery.

Benefits

Your participation on this research project will have both direct and indirect benefits for you since you and/or your families will be used in the future service after the interventions.

Incentives /Payments for Participating

You will not be provided any incentives or payment to take part in this project.

Confidentiality

The information collected from this research project will be kept confidential and information about you that will be collected by this study will be stored in a file, without your name, but a code number assigned to it. It will not be revealed to anyone except the principal investigator and will be kept locked with key.

Right to Refusal or Withdraw

You have the full right to refuse and withdraw participating in this research. You can choose not to respond some or all the questions) and this will not affect you from getting any kind of health related service and any social service within the community.

Person to Contact

The research project was reviewed and approved by Addis Ababa University, college of health science, school of public health, department of nutrition and dietetics. If you want to know more about the project and you have any question you can contact any of the following research staffs via the address provide below. I have read and understand all the information above and agree to participate on the research project.

Signature;

Participant

Data collector

Supervisor

Name ..

Name ..

Date

SPHMMC, SCHOOL OF NURSING

Confidentiality and verbal Consent

Assessment of Post Cardiac Surgery Intensive Care Unit Nursing care Practice for Patients Undergoing Open Heart Surgery and Associated Factors in Selected Cardiac Centers, Addis Ababa, Ethiopia 2023.

My name is_____ I am working as data collector for the study to be conducted by SPHMMC. I am interviewing nurses at ICU to collect information necessary to assess the nurses' practice and associated factors. To attain this purpose, your honest and genuine Participation by responding to all questions is very important and highly appreciable. It is expected that the interview will take about 15-20 minutes and no need of providing your name here. It is your full right for not to answer the questions partially or completely if you want not to respond. Again in any way it will not disturb the services you are getting from any health facilities and other community serving organizations.

I would like to assure you that all the information gathered will be kept strictly confidential. Are you willing to participate in our study?

No----- Yes-----.

Thank you for your response. Have a good day.

1. Date and time of interview: ----/------/------

Time interview finished: Hours: -----Minutes----- Interviewer initials-----

Appendix II: TOOL – 1 STRUCTURED QUESTIONNAIRE

ID no. of the Respondent_____ ID no. of Data collector_____Date_____

Part I; Socio-demographic and economic characteristics of nurses

Table 5 socio-demographic and economics characteristics of study participants

S. No.	Questions	Answers	remark
101	Age in years	-----	
102	sex	1.Male 2. Female	
103	Current working institution	_____	
104	marital Status	1. Single 2. Married 3. divorced	
105	Monthly income in ETB	-----	
106	Family size	-----	
107	Educational status/qualification	1. level IV nurse 2. BSc nurse 3. OR nurse 4. ECCN 5. MSc nurse 6. cardiac nurse 7. other -----	
Nurse related variables			

108	years of service as a Nurse	_____		
109	experience in PCS-ICU	_____		
110	Any special training related to cardiovascular system and diseases	1. Yes 2. No		
111	If question 110 yes, list them	----- ----- ----- ----- ----- -----		

Part II: Patient related variables

S.no	Variables	Responses		Remark
201	Age in years	-----		
202	Sex	-----		
203	Religion	-----		
204	Indication for surgery	-----		
205	Type of surgery	-----		
		Yes	No	
206	being with family			
207	Able to communicate			
208	Presence of comorbidity			
209	Cooperative patient			
2010	Friendly relationship with nurse providing care			

APPENDIX II: OBSERVATION CHECKLIST – NURSES PRACTICE IN PCVS-ICU

Observation checklist for assessment of nurse's practice in post cardiovascular surgery intensive care unit

S.no	Activities	Response	
		yes	No
	Before arrival		
	Make all machines and equipment ready for use		
	Prepare the bed as per the patient need		
	Cheek all necessary machines being functional		
	Make necessary drugs ready for use		
	Patient arrival		
	Take report from operating team		
	Use standard hand-over tool		
	talk directly with the operating team		
	Connect to monitoring system		
	Connect chest tube to wall suction		
	Isolate volume line		
	Identify type and time of last dose of anaesthesia		
	Identify type and time of last dose of narcotic or relating agent		
	Suitable patient position on bed		
	Initial assessment		
	Note peak pressure		
	Label all the infusion status with time start & end, amount of infusing contents		
	bilateral chest auscultation		
	check for position of NGT		
	observe site of surgery for any alteration		
	Note type and rate of IV infusion		
	Cheek for catheter		
	Obtain cardiac profile		
	Note amount and quality of chest drainage		
	Note quality of peripheral pulse		
	Peripheral temperature and skin colour		
	Cheek endotracheal tube size and position		
	Bilateral chest auscultation for breathing sound		
	Check probes: nasogastric and vesicle.		
	Validate LOC		
	Note expiratory volume and minute ventilation		
	Cheek for pupil reactivity		
	Cheek for quality and quantity of motor response		

	Initial cares		
	Obtain oxygen saturation via probe		
	Obtain ABG per order		
	Measure urine output		
	Check for blood pressure		
	Check for heart rate and rhythm		
	Ventilate the patient according to the patient status		
	Draw blood sample		
	Identification of vascular access: drug infusion line		
	Identify venous hydration line		
	Identify catheters for monitoring: Central Venous Pressure (CVP), Average Arterial Pressure (AAP), Left Atrium Pressure (LAP)		
	Open thoracic drains.		
	Place thoracic drainage bottles in a suitable recipient.		
	Investigate the position of the tracheal cannula and its correct fixation		
	Set respirator parameters.		
	Connect the patient to the respirator.		
	Review post-operative order		
	Obtain 12 leads ECG as per order		
	Obtain chest x-ray as per order		
	Draw stat blood per order		
	Titrate IV medication solutions per order or per weight		
	Review post-operative order		
	Initiate measures to warm the patient		
	Obtain 12 leads and EKG as per order		
	Titrate IV medication solutions per order or per weight		
	Consider ventilator weaning when it is indicated		
	On-going assessment		
	Obtain cardiac profile		
	Maintain nothing per-os until it is indicated		
	Measure input and output		
	Obtain arterial blood gas		
	Measuring central venous pressure		
	Check for colour and amount of drainage		
	Assess for nutritional status		
	Generally make close follow up for the patient		

	Characteristics of wound		
	Assess for pain status		
	Characteristics of exit site of catheter, drains, pacer wires		
	Cheek bowel sound		
	Measure heart sound and rhythm		
	On-going cares		
	Routine care for chest tube		
	Draw stat bloods for investigation		
	Consider ECG and EKG		
	Ex-tubation		
	Document what he/she did		
	Patient education for future health maintaining		
	Communicate about the patient health and care status with other team		
	review post-operative orders		
	Consider chest X-ray		
	close patient follow up		
	Maintain nothing per-os until it is indicated		
	Obtain arterial blood gas		
	Routine care for chest tube		
	Collect laboratory tests		

APPENDIX III: IN-DEPTH-INTERVIEW GUIDELINE

I want to thank you for taking the time to meet with me today. My name is _____ and I would like to talk to you about your experiences participating in the ICU specifically, your experience in post cardiac surgery ICU. The interview should take less than an hour. I will be taping the session because I don't want to miss any of your comments. Although I will be taking some notes during the session, I can't possibly write fast enough to get it all down. Because we're on tape, please be sure to speak up so that we don't miss your comments. All responses will be kept confidential. This means that your interview responses will only be shared with research team members and we will ensure that any information we include in our report does not identify you as the respondent. Remember, you don't have to talk about anything you don't want to and you may end the interview at any time. Are there any questions about what I have just explained?

Are you willing to participate in this interview?

_____	_____	_____
Interviewee	response	Date

Semi-structured in-depth-interview questions

Questions - guide	1. What do you say about post-cardiac intensive care unit? Different from other department? How? 2. What kind of activities you and your colleagues are performing in this unit? 3. How you are prepared and waiting for patient coming from operating room after open cardiac surgery intervention? 4. What are your roles for patients undergoing open cardiac surgery? 5. How you are receiving patient coming from operating room after surgery? 6. What immediate care you were giving for patient arrives near to you after cardiac surgery? 7. How do you maintain the started care after immediate post-cardiac surgery care given to end patient with survival? 8. Would you talk about drugs used in post-cardiac intensive care unit for patient life support? Types? Indications? Dosage? Side effect? 9. When the patient suffer of pain how do you managed the pain, if you do so? 10. What kind of problems you can see on patients underwent cardiac surgery? Would you explain them? (cardiac, non-cardiac complications, fluid and electrolytes, hemodynamic instability, pain, surgical site infection,) 11. What strategies or interventions you used to overcome or manage the problems happened with patients underwent cardiac surgery? May you discuss more? 12. To what extent you are happy during your stay in this unit? 13. What are some barriers, if any, that you encountered to give appropriate care for patient coming from operating room after cardiac surgery? (Organizational barriers? Individual barriers? Team or colleagues? Lack of technical support? Patient related barriers?) 14. How do you manage the barriers, if you did so? 15. What do you say about senior management and government role regarding care providing here in this unit?
	🚩 Is there anything more you would like to add? 🚩 I'll be analyzing the information you and others gave me and submitting a draft report to the organization in one month. I'll be happy to send you a copy to review at that time, if you are interested.

OVERALL GENERAL QUESTIONS; Describe your experiences with patient care in the postoperative period of open heart surgery, What difficulties can nurses encounter during caring for the patient in the postoperative open heart surgery period, when starting activities in the ICU?, Which difficulties a nurse can find even working longer in the cardiovascular ICU, and How do you explain the moment the patient arrives at the ICU after open heart surgery?

Thank you for your response and the time you spent