A Cross-Sectional Study on Practice of Emergency and Intensive Care Unit Nurses in the Initial Management of Myocardial Infarction and Hindrance Factors of Practice at National Referral Hospitals, Asmara, Eritrea

Senait Abraham Tesfamichael[1], Feven Beletse Negash[2†], Sebastian Schulz-Stuebner[3]
Laban Lebahati Simel[4]

ABSTRACT

Background: Myocardial infarction is one of the most frequent coronary heart diseases that are becoming almost epidemic in the new era. Despite the growing burden, myocardial infarction continues to receive a relatively low public health priority in Eritrea however; it is evident in many other African countries. A nurse must have adequate knowledge regarding the underlying mechanisms, subtle and obvious signs and must also possess competency of the emergency management.

Aim: This study aimed to assess the practice and hindering factors for practice of the Emergency and Intensive Care Unit nurses regarding initial management of myocardial infarction at the two National Referral Hospitals, in Asmara, Eritrea.

Methods: A quantitative and qualitative, cross sectional study was conducted at Emergency and Intensive Care Units. Nurses were selected by census method and data was collected from all the two units using a researcher administered structured questionnaire which was deliberated upon by a team of competent professional in the field of research before data collection. A self-developed observational checklist for practice based on review of similar recent literatures and guideline to assess the practice. Focus group discussion was also used to identify the hindering factors for practice. Analysis was carried out in SPSS (version 22) using chi-square, and independent t-test. The result was tested at significance level of 0.05. Thematic analysis was used for the qualitative part.

Result: This study included 54 nurse participants in both hospitals. 35% showed good level of practice. Improper handover and daily session, non-availability of nursing guideline, lack of enough number of staff and continuous up grading programs were amongst most common factors, which hinder the practice of nurses.

Conclusion: Since quite high percentage of the nursing staff had poor level of practice regarding initial management of MI, it is recommended to offer upgraded courses based on the guidelines. Assessment of the competency and performance of nurses on management of MI help the nurses to improve the quality of care delivered to patients

Key Words: Myocardial infarction; Intensive Care Unit (ICU); Emergency unit; Initial management; Practice; Nursing staff

Introduction

Myocardial infarction (MI) is one of the most frequent cardiovascular diseases that are becoming an epidemic in the new era of Non-Communicable Diseases (NCDs). Since it is an emergency disease if not treated on time it may lead to permanent injury or death of the heart muscle [1-3]. A retrospective study documented that MI rates progressively increase with increasing Coronary Artery Disease (CAD), ranging from 0.11% among patients with no apparent CAD to 2.47% among patients with the symptomatic CAD [2]. Due to the severity of the condition and critical status of the patients the initial hours of admission must be supervised by qualified health care providers among which nurses who are closest to the patient. Hence MI is a killer disease; it needs standardized care protocols and policies for nurses to achieve good outcomes through better care.

According to Watson`s and Nola Pender theory of nursing, Nurses should be equipped with sound knowledge and theoretical bases for health promotion which enables them to help individuals, families, and community to keep healthy. Nurses

[1]Department of Nursing, Unit of Emergency and Critical care Nursing, Asmara College of Medicine and Health Sciences, Asmara, Eritrea
[2]Public Health, Ministry of Health, Asmara, Eritrea
[3]German Guest Lecturer in Asmara College of Health Sciences, Consulting Centre for Infection Prevention and Control, Freiburg, Germany
[4]Community Medicine and Primary Health Care, Orotta College of Medicine and Health Sciences, Asmara, Eritrea
[†]Author for correspondence: Dr. Feven Beletse Negash, Department of Nursing, Unit of Emergency and Critical care Nursing, Asmara College of Medicine and Health Sciences, Asmara, Eritrea, Phone: 2917722712, E-mail: beletsefeven21@gmail.com

must incorporate scientific knowledge and technical advances into their practice to assist the patients in remaining well and functioning at the maximum level [4]. Scientific and technological advancement in critical care unit demands upgrading nurses on their knowledge to be able to identify life threating arrhythmias on the electrocardiogram and perform emergency resuscitation measure. In reference to the global and regional trends, MI has become one of the common medical problems in Eritrea that requires urgent action in emergency unit and ICU. According to World Health Organization statistical report of the year 2014 were, 157.9, 149, 59.8, 50.1, 36.1 per 100,000 of patients; in Yemen, Libya, South Sudan, Somalia and Ethiopia, respectively and that of Eritrea were 79.8 [5].

A review study that was done between 1997-2001 at Halibet National Referral Hospital, Asmara, Eritrea revealed that the incidence of MI was 4.35 per 1000 admissions with a mortality rate of 35.8% [6].

In another retrospective study done at Orotta National Referral Hospital in 2017 indicated that the prevalence rate of acute coronary syndrome was 8.5%. Majority (86.6%) of admissions were reported from urban with an increasing of ICU bed occupancy rate from 9.3 in 2015 to 11 days in 2017 [7]. Although this high morbidity and mortality rate had no clear reasoning, it can be explained that difference in management of the health providers and the difference of performance could have played a role [6]. Due to the fact that MI is the major cause of death and generates the greatest number of hospitalizations with increasing health care expenses the management of MI should receive high priority in national health policies and preventive health care programs.

Lack of trained intensive and emergency care specialized nurses in Eritrea has promoted the use of general nurses to work in ER and ICU and are supposed to have adequate practice on the initial identification and management of MI. Inadequate treatment has been mostly related to the health care providers, failure to assess patient`s conditions and to follow the changes. Assessing and cultivating the practice of health care providers, especially nurses is essential, in order to achieve the Eritrean Sustainable Development Goals-3 (SDG); that states "to ensure healthy lives and promote well-being for all at all ages".

Reports from Orotta National Referral Hospital ICU, there were 153 medical deaths out of 306 patients, 136 deaths out of 339 and 147 out of 402 patients. The patient average stay in ICU was 6.15,

8.9 and 9.3 days, in the years of 2012, 2013 and 2015, respectively.

As per researcher's knowledge, there was no research done related to the nurses' practice and hindering factors for practice regarding initial management of MI in Eritrea. Even though, mortality of patients secondary to MI is expected to have multiple causes, this research tried to assess the practice of nurses and hindering factors for practice regarding initial management of MI in the National referral hospitals of Asmara, Eritrea.

Method

■ Study design

The study was descriptive cross-sectional study. Qualitative and quantitative approach was used to assess the practice and affecting factors for practice of nurses who work at ER and ICU regarding initial management of MI.

■ Study areas

The study was carried out at Orotta and Halibet National Referral Teaching Hospital, adult intensive care Department that include EU and ICU from November 2017 to February 2018. The two hospitals are located in Asmara. They are the Medical National Referral Hospitals available in the country which provide health care service at tertiary level including intensive care and emergency services. The hospitals have different departments that provide comprehensive health care services for all age groups of people from the entire country. ONRTH has total bed of 517 of all departments and specifically 185 beds of medical surgical and 164 nurses out of total 358 nurses. Similarly HNRTH accommodates a total of 236 beds for inpatient with the current bed occupancy rate of 58 percent and an average length of stay of eight days based on the statistical report in July 2017.

■ Study population

All the nurses who work in the adult emergency and intensive care units of the Hospitals were included. The nurses were of all levels of education (15 certificate, 27 diploma and 12 degree nurses, in both areas with total of 54 nurses). Purposive sampling was used and 14 nurses were selected for the focus group discussion.

■ Data collection tools and method

Upon review of similar recent literatures review and guideline of (Marco Roffi, 2015) a Self-developed Observational checklist for practice composed of items done immediately on time, assessment on

A Cross-Sectional Study on Practice of Emergency and Intensive Care Unit Nurses in the Initial Management of Myocardial Infarction and Hindrance Factors of Practice at National Referral Hospitals, Asmara, Eritrea

Research

practice, supportive action and education with psychological support given. The level of practice was categorized as very good (≥ 75), good (60–74), average (50–59), poor (<50). Focus Group Discussion scheduled (FGD) to identify the hindering factors of practice. Written consent was used for asking the participants willingness and if they don't agree they are free to quit from the study at any time. All the information provided by the participant and their identification was kept confidential.

■ Data collection procedure

The procedure for data collection was done from November 2017 to February 2018. Data collectors were trained regarding the data collection procedure ahead before the start of the actual work. Written consent was used for asking the participants willingness and those who were willing to participate were involved. Practice was observed through checklist on patients without the awareness of the nurses. Focus Group Discussion was done with a group of 7 nurses in each hospitals. Nurses were selected randomly with different demographic characteristics. FGD has taken about 1 hour for each group, through this the themes and subthemes were selected to identify the hindering factors. After filling the questionnaires and FGD, data collectors checked for its completeness at the site of the study area and submitted to be revised and coded.

■ Data processing and analysis

Data cleaning was performed to check for accuracy, consistency and for avoidance of missed values before data entry. The cleaned data were entered into SPSS version 22. Descriptive analysis of the demographic characteristics, practice on MI was done using frequency, percentage, mean SD, median and Interquartile Range (IQR) as appropriate. T-test and one way ANOVA was used to assess the difference in practice level by work area and work unit. The result was tested at significance level of 0.05. Qualitative approach of the study was done using thematic frame work analysis after formulating themes and subthemes.

Result

■ Description of socio demographic characteristics of nurses

The average median age of all nursing staff categories who participated in the study was 27 years (IQR=5 years) having a minimum of 22 and maximum 56 years of age. Age distribution depicts the highest percentage as 59.3% were in the range of 26 years-35 years, whereas the lowest percentage as 9.2% were in the range of 36 or greater with male to female ratio of 1.3:1.

The mean years of experience of those who work in ICU was found to be 4.03 years with a Standard Deviation (SD) of ± 2.13. The Median years of experience of the ER nurses were 3.0 years with an IQR of 3.25.

The majority of nurses (60%) had experience less than 5 years in ICU while 40% has 5 or more years' of experience. Distribution of nurses by clinical experience in ER showed that only 75.61% had less than 5 years' experience at ER, and 24.39% presented with 5 or more years of experience. This is mentioned in table 1 below.

Table 1: Socio-demographic characteristics of the nurses working in ER and ICU (n=54).		
Characteristics	**Number(n)**	**Percentage (%)**
Age, years (Median=27, IQR=5, Min.=22, and Max.=56)		
25 or Less	17	31.5
26 years to 35 years	32	59.3
36 years or Greater	5	9.2
Gender		
Male	31	57.4
Female	23	42.6
Nurses Educational level		
Associate Nurse	9	16.7
Nursing Diploma	33	61.1
Nursing Degree	12	22.2
Work Area		

	Halibet NRH	24	44.4
	Orotta NRH	30	55.6
Total Experience, years (Median=4.0, IQR=3.0)			
	Less than 5	25	46.3
	5 or More	29	53.7
*ICU Experience, years (n = 15, Mean=4.03, SD=2.13)			
	Less than 5	9	60
	5 or More	6	40
*ER Experience, years (n =41, Median=3.0, IQR=3.25)			
	Less than 5	31	75.61
	5 or More	10	24.39

*Working unit experience was either in ER or in both

As table 2 and figure 1 below shows that the patient - staff nurse interaction was observed to be 70% and 25% as immediately and late practices respectively, whereas only 5% of patients didn't get the services within the time of observation. Out of the 40 patients, 60% were observed and placed at the appropriate emergency beds immediately and 35% received lately. The practice which was done by the nursing staff regarding connecting monitors to the patients revealed that almost similar results for an immediate 37.5% and late practices 35%, and 27.5% of the patients didn't receive monitoring.

Practice of nursing staff for the measurement of vital signs was 67.5%, IV line insertion 65% and administration of oxygen was observed to be 67.5% as an immediate. Nurses performance on 12 lead ECG and administration of morphine, nitrate and aspirin were observed in 45% and 75% as an immediate and as late in 50%, 22% of the patients respectively.

Although the standards were not met, a continuous vital signs assessment were done by the nursing staff for 77.5% of the patients, blood sample 32.5% and chemistry analysis 30%. Monitors were connected on 52.5% of the patients and 40% were assessed about their pain without standard pain scale measurements.

Related to education and psychological support that was given by the nursing staff, 50% of the patients received reassurance and majority of them 77.5% were given appropriate education towards reduction of exercise. In contrast to the above results, very low results of 27.5% were recorded for education on diet and 30% of the patients received education on reducing anxiety. Regarding the psychological support to family of the patients with MI, only 30% of the families were given and 52.5% of the patients were helped to reduce exercise. This is clearly stated below in table 3.

Table 2: Description on management (items wise) of MI patients in terms of practice by nurses working in ER and ICU along with time specification (n=40).

Practice	Immediate n (%)	Late n (%)	Not done n (%)
Practice done immediately on time			
Interaction with patients	28 (70)	10 (25)	2 (5)
Appropriate emergency bed	24 (60)	14 (35)	2 (5)
Connect monitors	15 (37.5)	14 (35)	11 (27.5)
Vital sign assessment	27 (67.5)	11 (27.5)	2 (5)
Intra venous line insertion	26 (65)	10 (25)	4 (10)
Oxygen administration	27 (67.5)	8 (20)	5 (12.5)
12 lead ECG	18 (45)	20 (50)	2 (5)
Administration of MNA	30 (75)	9 (22.5)	1 (2.5)

A Cross-Sectional Study on Practice of Emergency and Intensive Care Unit Nurses in the Initial Management of Myocardial Infarction and Hindrance Factors of Practice at National Referral Hospitals, Asmara, Eritrea
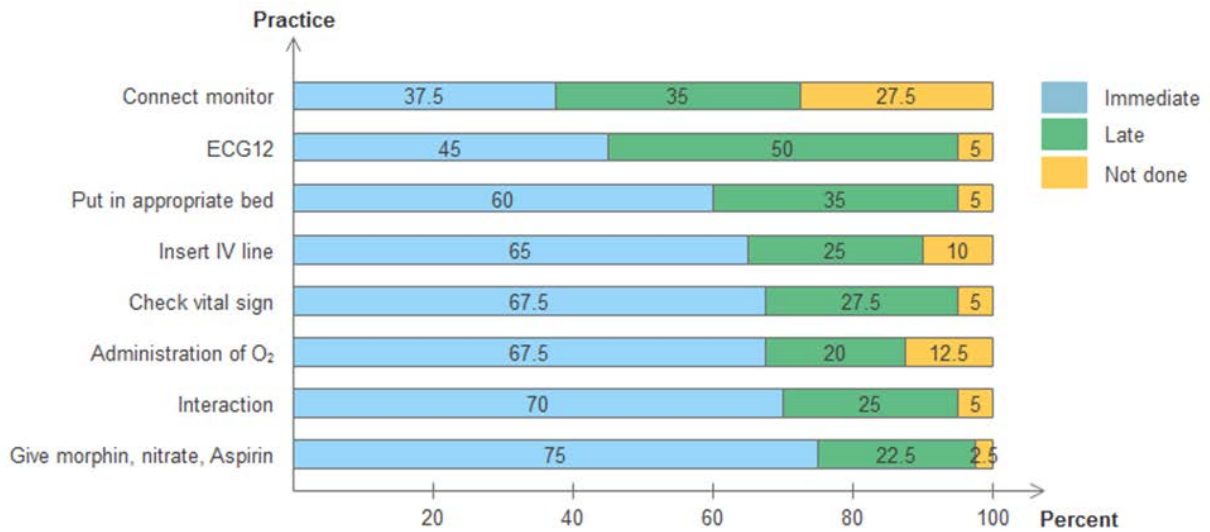
Research

Figure 1: Horizontal bar diagram shows the percentage distribution of various degrees of practice.

Table 3: Description on management (items wise) of MI patients in terms of practice by nurses working in ER and ICU (n=40).		
Variables	**Done n (%)**	**Not done n (%)**
Practice on assessment		
Take vital sign	*0 (0)	0 (0)
	** 31 (77.5)	9 (22.5)
Take blood sample	*0 (0)	0 (0)
	**13 (32.5)	27 (67.5)
Chemistry	12 (30)	28 (70)
Connect monitor and reassessment	21 (52.5)	28 (47.5)
Assessment of pain	16 (40)	24 (60)
Supportive action taken		
Insert urinary catheter	24 (60)	16 (40)
Check prescribed medications	28 (70)	12 (30)
Give proper diet	8 (20)	32 (80)
Documentation	22 (55)	18 (45)
Education and psychological support		
Reassurance	20 (50)	20 (50)
Reducing exercise	31 (77.5)	9 (22.5)
Diet	11 (27.5)	29 (72.5)
Reducing anxiety	12 (30)	28 (70)
Psychological support to family	12 (30)	28 (70)
Reduce physical	21 (52.5)	19 (47.5)

*Standard, **Not standard*

As table 4 demonstrates most of the patients 35% were provided good care, but at the same time 30% of the patients received poor care.

Table 4: Mean, SD, frequency and percentage on level of care provided (practice) to the patient by the nurses (n=40).

Level of practice	Mean % (SD)	Range	n (%)
Poor	39.90 (8.65)	18.18-48.48	12 (30)
Moderate	54.54 (2.80)	51.52-57.58	8 (20)
Good	67.10 (4.42)	60.61-72.73	14 (35)
Very good	78.80 (2.71)	75.76-81.82	6 (15)

Practice of nursing staff on the initial management of MI between the selected hospitals was observed to have a significant difference (p=0.004) (Table 5).

Table 5: Association of practice to wards MI patients and work area, among nurses working in ER and ICU (n=40).

Variables	M (SD)	Diff.* (95 CI)	p-Value
Work area			
Halibet NRH	15.17 (3.125)	-6.627 (-11.03, -2.22)	0.004**
Orotta NRH	21.79 (5.133)		

Table 6 shows the result of parametric test (ANOVA) showing a significant difference in practice of the nursing staff among the work units (p=0.012). Post hoc analysis using Bonferroni Method revealed a significant difference of practice between Halibet ER and Orotta ICU at (p=0.010) and Orotta ER and Halibet ER (p=0.036).

Table 6: Association of practice to wards MI patients and work units, among nurses working in ER and ICU (n=40).

Variables	M (SD)	Diff.* (95 CI)	p-Value	Post hoc
Work units				
Orotta ER	21.79 (5.759)	-1.77 (-8.13,4.59)	0.012*	H.ER<O.ER 0.036*
Halibet ER	15.17 (3.125)			O.ER<O.ICU 1.000
Orotta ICU	22.77 (3.940)			H.ER<O.ICU 0.010**

H.ER=Halibet emergency, O.ER=Orotta emergency, O.ICU=Orotta intensive care unit

As table 7 shows the average age of nursing staff was 33.8 years with a range of 23 years-50 years. Each theme is described by subthemes, which are supported by statement of the nurses through the discussion. Finally, a report on findings was prepared based on the written notes and tape recordings.

Table 7: Description of Theme and sub themes by focus group discussion (n=14).

Themes	Sub themes
Level knowledge and information	Continues training programs
	Daily session and proper hand over techniques
	Workshops and provision of training programs
Nurses value to ward treating and prevention	Motivation of nursing staff
	Interest and enthusiasm to treat critical ill patient including MI
Availability of clinical resources	Nursing guidelines/standards
	Equipment, supply and medications
	Human resources
Nature of work units	Work environment and crowded units
	Lack of time
	Fatigue

A Cross-Sectional Study on Practice of Emergency and Intensive Care Unit Nurses in the Initial Management of Myocardial Infarction and Hindrance Factors of Practice at National Referral Hospitals, Asmara, Eritrea

Research

Theme-1: Level of Knowledge and Information about the Initial Management of MI

Focus Group Discussion (FGD) revealed a deficiency on certain areas that include: ECG interpretation, in depth knowledge on MI pathophysiology and its management protocol and formal and continuous education.

Majority of the nursing staff pinpointed that they were having problems in daily practice due to inadequate theoretical knowledge, which can affect the performance and motivation of nursing staff negatively. The three main subthemes were…

■ Continuous up grading programs

The nursing staff mentioned that there was a deficiency of specialization programs. Moreover, the nursing staff also recognized the importance of these programs as an improvement for their knowledge and understanding towards MI management. These was supported by the statements of Nursing staff who had work experiences 5 years and greater, said

"We are slowly turning to habitual mechanical workers without any conceptual development or knowledge." (Male Nurses from Orotta and Halibet ER)

"Despite having an accumulated work experience my knowledge on the other hand seems to deteriorate with time, with an exception of the first couple of years" (Male Nurse Form Orotta ER).

■ Daily sessions and proper hand over techniques

The raised issue of unavailability of proper handover systems and daily sessions within the shifts that enable them to know each other in terms of their performances and evaluate the situation through those and other inter-personal professional communication. Absence of such behaviors among nursing staff negatively affect the knowledge, not only on MI and its management but also critical care nursing as whole. One of the nursing staff from ICU mentioned that…

"In ICU there was relatively proper documentation in comparison with ER but the hand over that is currently done is still inadequate." (Female Nurse form ICU)

■ Workshops and provision of training programs

The nursing staffs have identified some problems regarding the lack of inspiring personal development programs and this is as one of the hindering factors for effective practice of nurses.

Theme-2: Nurse's Value towards Treatment and Prevention of MI

■ Motivation for the nursing staff to work

Most of the nurses mentioned that timely motivations have a great impact on the performance of the health professionals. ER and ICU are the two places in hospitals where patients with critical and catastrophic life situations are common and death might reign. Apart from this, the presence of stressful conditions influences the emotion and the professional behaviors of nurse. These information was supported by two male nursing staff from both ER hospitals where motivations could be enhanced and said that

"The presence of ineffective supervision and lack of performance appraisal to evaluate the level of knowledge and skill that could enable them to work efficiently." (Male Nurse form Halibet and Orotta ER)

■ Interest and enthusiasm to treat critical ill patients including MI

Nursing staff mentioned that they have a positive interest to treat critically ill patients including MI; even though it is not the area of their preference to work. It is undeniable that some of the nursing staff also possess indifferent attitudes that could affect the critical nature of ER and ICU negatively and become an obstacle in performing holistically. Negligence results from the failures of such attitudes and thoughts saying that the primary responsible person for the patient is the physician. In some situations, this poor performance and negligence was understood and felt by the patients and brought dissatisfaction. All in all, the root of the problem can be said as improper placement and irresponsibility of the nursing staff; which lead to a lower performance. Two staff nurse from ICU also stated that

"I always wanted to work in maternity hospital and I was hoping to be assigned there, but unfortunately I was assigned to ICU. I didn't hate it and even there are times where you stay more than the required time." (Female Nurse from ICU)

"Since more responsible person is the Doctor of that unit I just do based on the order." (Male Nurses from Orotta ER)

Theme-3: Availability of Clinical Resources

Lack of standards/ guidelines for management of MI

According to the information from the group, there are no specific standards or guidelines for the nurses to follow on the management of MI both in ER and ICU leading to decrease in the quality of care.

■ Equipment, supply and medication

There were no enough devices for monitoring and managing patients with MI and some were not available in the hospital such as monitoring and recovery devices like pacemakers etc. This deficiency of devices can be seen as a hindrance factor that affects the nurses from performing their practice well. Since oxygen supply is deficient in the hospitals, It`s availability in ER and ICU add an extra burden and more patients are sent to the units resulting in a decrease in the bed turnover rate. Further in-depth clarification was obtained by two nursing staff statement that

"Availability of oxygen in ER and ICU only increase the bed occupancy rate and decrease the discharge or the transfer rate of the patients." (Nurse from Orotta ICU)

"Another one stated that since there is a problem of oxygen, it would be good if there could be a room where 4 or 5 beds solely provide oxygen." (Nurses from Orotta ER)

Despite the availability of adequate medications like inotropes and opioids analgesia, pain control and assessment were inadequate. Nurses mentioned that they have hesitation to administer higher medication like morphine, etc.

■ Human resources

Ineffective number of staffs obliges the staffs to work hard, which leads to a reduced and diluted performance as the limited staff members ought to give care to all the patients. One participants said

"It is good to work based on the standard nurses to patient ratio and since we don't have enough staff, individual patient assignment couldn't carry out" (Nurse from ICU).

Theme-4: Nature of the Work Units

Since Public hospitals provide health care to the patients with low cost services and getting referrals from periphery health centers, the number of patients seeking care from these health facilities was huge. Poor triage systems add extra burden to nurses and limits the focus on those patients who are really in need. On the other hand, general nurses who have no special training, feel difficult to take decisions on time.

■ Crowded work area and busy units

One of the factors that were mentioned as a barrier for practice were being busy and crowded in ER and ICU. Usually patients arrive in the units with few or no relatives and especially in ICU where the patient care is in the hands of the staffs and no family help is asked, made it to be busy also. Presence of high workload diminishes the quality and completeness of care. The nursing staffs form ER and ICU

"Since it is more crowded, this made the practice of the nursing staff to be less adequate and diluted. At the same time patients that are treated in other hospitals and as outpatients add burdens to the units." (Nurses from Halibet ER)

■ Fatigue

More work load and less nurses for patients in ER and ICU made the nursing staff to be tired and the feeling of exhaustion affected the effective and comprehensive care. Fatigue reduces a nurse's accuracy in performance and even the level of understanding.

■ Lack of time

Lack of adequate time negatively affects the performance of the nurses, since nature of the work units is busy and crowded which results in inability to relax themselves and thorough reading of documents.

Discussion

■ Description of socio demographic characteristics of nurses

The study delineated that majority (57.5%) of nurses were male showing unequal distribution that males have more participation. The present study was in line with a study done by Al-ftlawy that identified similar results whereby 52.6% of the nurses were males [8]. However, it was found to be inconsistent with studies conducted in Sudan and India that indicated more female nurses compared to males [9,10].

Majority of the nursing staff were among 26 years to 35 years of age with a median age of 27 years and 4 years of experience. Nurses with

A Cross-Sectional Study on Practice of Emergency and Intensive Care Unit Nurses in the Initial Management of Myocardial Infarction and Hindrance Factors of Practice at National Referral Hospitals, Asmara, Eritrea

Research

experiences less than 5 years were 9 (60%) and 31 (75.61%) in ICU and ER respectively. This result reflected that, most of the nurses working in hospitals were junior nurses who recently graduated. This study was consistent with the study done in North Africa which indicated that 22 years-27 years had the highest percentage [8].

■ Description on the practice of nurses

The practice of nurses observed was found to be very good on administration of morphine, nitrate and aspirin. A good result was also identified namely on, the assessment vital sign, oxygen administration, IV line opening and appropriate emergency bedding. However, 2.5% to 10% of patients were not completely received the aforementioned items. These could be because the procedures are being performed as routine. On the other hand, poor practice was identified as regard to 12 lead ECG and connecting monitors. This could be due to the poor knowledge, negligence of nurses and deficiency of adequate number of monitors for patient's use, especially in the ER. Furthermore, it can be stated that there was an expectation on the practice of nurses from HNRH to be poor as it is a trauma centered hospital.

This study was supported by a study conducted in India and Sudan which stated that the skills in ECG-monitoring among nursing staff was poor [11]. A very good practice was documented in the aspect of interaction when patient arrives, appropriate emergency bedding and on administration of MNA. But the same study was also incongruent by showing poor, moderate and good practice on 12 leads ECG; connect monitor and administration of oxygen respectively [9].

The present study identified that moderate practice was observed on patient`s urinary catheterization and ordered drug checkup. Also a very good result (77.5%) on vital signs assessment was achieved, without following the standards, which was sub-optimal to the standard that the assessment of vital signs every 15 minutes for 4 hours, then every one hour for 4 hours and finally as needed [12]. The FGD mentioned that there is unavailability of management guidelines or protocols for nurses to follow.

Regarding the performance of nursing staff on education and psychological support for patients and family, results were poor, whereas a very good practice was observed on patients' education regarding reducing exercise. Similarly, poor result was identified on the assessment of pain and taking blood sample. This could be due to non-availability of standards for pain management and inadequate knowledge of the nursing staff. Results from qualitative study also noted that pain scores should be recorded based on the appropriate pain scale methods, and accordingly analgesia can be reviewed and given. Nurses also mentioned that this technique is not only helpful for the patients but also for controlling and proper usage of the resources based on its needs. Researchers suggest that provision of protocols in ICU, implementation of training courses, and appropriate selection of nurses can have strong impacts on final pain relief and treatment of MI [13].

A study done by found to be inconsistent with present study finding that poor practice was found on urinary catheterization, reassurance and psychological support for the patients with their families, patient education, assessment of pain level, ranging from 24.5% to 49.5%. Another study was consistent with the present study, documenting that almost all participants did not provide education due to a lack of knowledge and skill [9,14].

Uniform results was found in a study done, showing poor performance in different aspects of practice i.e., majority (82.4%) of the nurses had lack of education on assessment tools, poor documentation on pain assessments and management was identified on 77.6 % of the nurses [15]. A similar Study done in Egypt also identified that nurses had low practice scores regarding the implantable cardiac devices ICD [16].

The overall practice result identified that 70% of the patients received practice that ranges from moderate to very good. However, the remaining 30% of the patients received poor practice of care. Though it was satisfactory practice, the nursing care did not reach the desired level owing to the deficiency in the knowledge level of the nursing staff and its effects on the initial management of MI. A study done in Iran was in line with the current study and showed that the reduction in the number of professional nurses and use of untrained or general nurses have adverse impact on the quality of care in ER [17,18].

■ Association of practice with selected socio demographic characteristics of nurses

As it is indicated in the study, the mean level of practice of the study participants on average was

found to be good and it has consistency with a study conducted in Iraq by Qadir & Younis (2014) documenting that fair quality of nursing care for patients with acute MI at coronary units of Erbil city hospitals was found [6].

Higher result was obtained in the practice level among the nursing staff at ONRTH and this might be due to presence of advanced medical equipment's. Orotta as it's a medical referral hospital that mainly renders services of ICU, presence of advanced equipment contributes to the better practice among the nurses comparatively to Halibet ER nurses.

Ten year retrospective study on ACS in Eritrea done, documented that patient admission at ONRTH was 86.5 % (n=258) [6]. Therefore, this study results showed a higher practice of the nursing staff working at ONRTH, and this can be argued with the above study indicating as the number of patients admitting to ONRH-ICU increases, the nurses' level of exposure to MI cases will also be increased. Since the practice is done as a routine and in teams, this could have influenced the practice level to be higher and the findings from FGD also strongly support this reasoning.

The Study done by was also in line with the existing study identifying that the practice or the quality of care given by the nurses on post MI cardiac catheterization was adequate due to ample knowledge level [6]. A recent study done in Egypt found to be inconsistent with the study in which the critical care nurses have low practice scores and no significant association existed between socio demographic factors as regard to ICD [16]. Similar study also identified that the nursing staff had low practice scores with no association between years of experience and the level of knowledge, hence critical care nurses had inadequate practice regarding ICD [19,20].

Conclusion

Most of the nursing staff had fair level of practice about the initial management of acute myocardial infarction during an emergency situation that was evaluated as teamwork.

The practice of nurses had significant difference between the work areas and units. The most identified factors that hinder the nurses' practice or performance were improper hand over and daily session, unavailability of guideline or standards for nurses to follow, poor number of staffing and deficiency of continuous training

and specialization programs. Hence, health professionals especially the nursing staff of the tertiary hospitals need to acquire adequate knowledge and perform better practice on the initial management of MI, since the initial time is crucial and determinant to the patient survival.

■ Recommendation

- Nurses need to be given continuous training in MI in order to improve their knowledge in order to be able to treat and save patients.

- Policy makers should emphasis on initiation of staff development programs for nurses regarding standard guidelines for management of MI at all the levels of care.

- In-service education should be provided to nursing staff to update their knowledge regarding emergency management of acute coronary disease and more emphasis has to be made on initial hours of MI.

- Nurses should be given opportunities for further education on specialized well skilled man power in the field of critical care and emergency.

- Timely performance appraisal and follow up of the nurses' performance in relation to the topic of interest should be done.

- Further research should be done in order to identify the effectiveness of structured teaching program on knowledge regarding management of MI.

Declaration

■ Limitations of study

- Because of the nature of the study area: In emergency and ICU the nursing staff work as a team, the researcher cannot evaluate the practice individually.

- It was difficult to find association with the other socio demographic variables of nurses and relationship between knowledge and practice.

■ Abbreviations

ACS: Acute Coronary Syndrome, **B.Sc.N:** Bachelor of Science in nursing, **CHD:** Coronary

A Cross-Sectional Study on Practice of Emergency and Intensive Care Unit Nurses in the Initial Management of Myocardial Infarction and Hindrance Factors of Practice at National Referral Hospitals, Asmara, Eritrea

Research

Heart Disease, **CVD:** Cardio Vascular Disease, **ECG:** Electrocardiography, **FGD:** Focus Group Discussion , **ER:** Emergency Room, **HMIS:** Health Management Information System, **HNRH:** Halibet National Referral Hospital, **ICU:** Intensive Care Unit, **IHD:** Ischemic Heart Diseases, **MDG:** Millennium Development Goal, **MI:** Myocardial Infarction, **MONA:** Morphine, Oxygen, Nitrates, and Aspirin, **NCDs:** Non-Communicable Diseases, **ONRTH:** Orotta National Referral Teaching Hospital, **SD:** Standard Deviation, **WHO:** World Health Organization

Author`s contribution

SA: Study conception and design of study, acquisition of data, analysis and interpretation of data, drafting and submission of manuscript; SS: participated in designing and coordination of the study, revising the manuscript critically for important intellectual content; FB, LL: participated in designing, drafting and revising the manuscript critically for important intellectual content, All authors read and approved the final manuscript.

■ Ethical approval and consent to participate

A formal research study approval was obtained from Ministry of Health Ethical and scientific Committee of the Asmara College of health Sciences as well as that of the Ministry of Health. A written paper was provided for getting permission for data collection to Health Facility Management Division and the two studies areas Hospital Directors. Written consent was used for the participant's willingness and all the information provided was kept confidential. We the undersigned research team, comprising of skillful medical ofcers and public health professionals in this original research article would like to declare that all the necessary methods and procedures as regards human subjects' studies were carried out in accordance with the principles and guidelines as outlined in the declaration of Helsinki, the entire process of data collection, data analysis, data presentation and dissemination.

■ Consent for publication

Not Applicable

■ Competing interests

The authors declare that they have no competing interests.

■ Funding

■ Availability of data and materials

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

References

1. Jeremias A, Brown DL. Cardiac intensive care e-book. Elsevier Health Sci. 15, (2010).

2. Maddox TM, Stanislawski MA, Grunwald GK, et al. Nonobstructive coronary artery disease and risk of myocardial infarction. Jama. 312,1754-1763(2014).

3. Mustafa HE, Elfaki BM. Nurses' attitude with physician collaboration during management of patient with acute myocardial infarction using thrombolytic agent at public teaching hospitals in khartoum state, sudan. Age. 25,25-29.

4. Feroze M, Afzal M, Sarwar H, et al. Knowledge and practice of registered nurses about patient safety after cardiac catheterization in punjab institute of cardiology hospital in lahore, pakistan. Int J Musculoskelet Pain Prev. 2,233-238(2017).

5. Oliver JM, Gallego P, Gonzalez AE, et al. Impact of age and sex on survival and causes of death in adults with congenital heart disease. Int J Cardiol. 245:119-249(2017).

6. Schwartz BG, Kloner RA. Drug interactions with phosphodiesterase-5 inhibitors used for the treatment of erectile dysfunction or pulmonary hypertension. Circulation.122,88-95(2010).

7. Adgoy ET, Seyoum Y, Berhe A, et al. Prevalence, presenting complaints, risk factors and comorbidity of acute coronary syndrome at orotta national referral hospital intensive care unit eritrea: Retrospective study. Sci J Public Health. 10,457-463(2017).

8. Al-Ftlawy DM. Determination of nurses' knowledge toward care provided to patients with acute myocardial infarction in Al-Najaf City. Kufa J Nurs sci. 2,111-126(2012).

9. Hamed LA, Yassein NH. Effect of Training Program on Internship Nurses' Performance Regarding Congestive Heart Failure Patients. IOSR J Nurs Health Sci.9,58-68(2020).

10. Wright RS, Anderson JL, Adams CD, et al. 2011 Accf/Aha Focused update of the guidelines for the management of patients with unstable angina/non–st-elevation myocardial infarction (updating the 2007 guideline) a report of the american college of cardiology foundation/american heart association task force on practice guidelines. Circulation.123,2022-60(2011).

11. Xavier B. Effectiveness of self-instructional module regarding emergency management of patient with myocardial infarction on knowledge among staff nurses. J Nurs Health Sci. 2,14-19(2013).

12. Roffi M, Patrono C, Collet JP, et al. 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Pol Heart J (Kardiol. Polska). 73,1207-94(2015).

13. Yava A, Çicek H, Tosun N, et al. Knowledge and attitudes of nurses about pain management in turkey. Int J Caring Sci. 6(2013).

14. Ozdemir L, Akdemir N. Nurses' knowledge and practice involving patients' resuming sexual activity following myocardial infarction: implications for training. Aust J Adv Nurs. 26,42-52(2008).

15. Kizza IB. Nurses' knowledge and practices related to pain assessment in critically ill patients at mulago hospital, Uganda (Dr. Diss. Muhimbili Univ. Health Allied Sci.).

16. Ali NS, Youssef W, Mohamed A, Hussein A. Nurses' knowledge and practice regarding implantable cardiac devices in Egypt. Br. J. Card. Nurs. 10,34-40(2015).

17. Mahmoudi H, Mohmmadi E, Ebadi A. Barriers to nursing care in emergency wards. Iran J Nurs Midwifery Res. 18,145-151(2013).

18. Kareem HM, Hamza RA. Effectiveness of clinical guideline regarding post arterial sheath removal on reduction of complications in patients after cardiac catheterization: randomized control trial. Remit. Rev. 8(2023).

19. Bosk EA, Veinot T, Iwashyna TJ. Which patients and where: a qualitative study of patient transfers from community hospitals. Med Care. 49,592-598(2011)

20. Mustafa HE, Elfaki BA. Determination nurses' knowledge about initial drugs used during emergency management of acute myocardial infarction. J Nurs Educ Pract. 7(2017).