

Management Of Coronary Care Unit In A Specialized Hospital

Sujala Costa ^{*1}, Arifa Sultana², Sajeda Khatun³ and China Rani Mittra⁴

¹Senior Staff Nurse, National Institute of Cardiovascular Diseases and Hospital (NICVD), Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh.

²Senior Staff Nurse, National Institute of Cardiovascular Diseases and Hospital (NICVD), Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh.

³Sajeda Khatun, Lecturer, Dinajpur Nursing College, Dinajpur, Bangladesh.

⁴Nursing Officer, Upazilla Health Complex, Abhaynagar, Jashore, Bangladesh. Email; chinamittra@gmail.com, Phone-+8801728604022

*Corresponding Author: Sujala Costa, Senior Staff Nurse, National Institute of Cardiovascular Diseases and Hospital (NICVD), Sher-E-Bangla Nagar, Dhaka-1207, Bangladesh. Phone -01716899728; Email:sujalacosta@gmail.com

Funding agency: None of the authors have received any funding from any person or any organization.

Contribution to authors: All authors involved in protocol preparation, data collection and literature search up to manuscript writing as well as revision of this manuscript.

Abstract—Today Cardiovascular Diseases (CVD) became the most common cause of death accounting for 30% of death worldwide, with 80% of the burden now occurring in developing countries. A cross sectional study was conducted at (CCU) in (NICVD) from January to December 2016 to assess the management status of CCU in a specialized hospital. Sample size was 150 service providers who were selected purposively from the study unit. Observation, record review and face to face interview were done through checklist and semi-structured questionnaire. Findings of the study revealed that clinical & nursing service were provided hundred percent by the service providers. The availability of diagnostic procedures for cardiovascular diseases were 94.44% existed in CCU of NICVD. All the physical facilities were available in CCU. The major functional equipment's were 84.5% and ancillary equipment's were 84.7% accessible. The essential medication were 93.1% and all non-essential medication for CCU were supplied by the hospital store according to weekly requirement. In the CCU of NICVD 28.3% service provider were trained up on CCU related management. In the CCU 95.3% respondents segregated wastes according to color code. More than half of the respondent's opinion were good regarding Central Sterile Service Department (66.2%) and security service (70%). Most of the service providers (96%) were satisfied regarding quality of diet supply and laundry service. Nearly all of them were satisfied about the overall cleanliness (96%) and overall management (94.7%). One third of the respondents recommended to increase number of bed and sufficient supply of medicine and equipment's for further improvement of CCU.

Finally the study revealed that the management of CCU in NICVD was satisfactory with some recommendation by the service providers.

Keywords—Coronary Care Unit, Cardiovascular Diseases, Doctors, Nurses, supporting staffs, Specialized hospital, Bangladesh.

1.1 Introduction

A coronary care unit (CCU) or cardiac intensive care unit (CICU) is a hospital ward specialized in the care of patients with heart attacks, unstable angina, cardiac dysrhythmia and (in practice) various other cardiac conditions that require continuous monitoring and treatment. The main feature of coronary care is the availability of telemetry or the continuous monitoring of the cardiac rhythm by electrocardiography. This allows early intervention with medication, cardio version or defibrillation, improving the prognosis. As arrhythmias are relatively common in this group, patients with myocardial infarction or unstable angina are routinely admitted to the coronary care unit. For other indications, such as atrial fibrillation, a specific indication is generally necessary, while for others, such as heart block, coronary care unit admission is standard (Wikipedia, 2016) [1].

Cardiovascular diseases (CVDs) have emerged as the leading cause of mortality in worldwide with developing countries accounting for 80% of cardiovascular deaths. The mortality data from first phase of the Million Death Study showed CVDs as the largest cause of deaths in India leading to 1.7–2 million deaths annually (Ala Alwan, 2011 & Registrar General of India, 2009) [2, 3].

According to the Global burden of diseases study in India, coronary artery disease is the largest contributor to CVD accounting for over 35% of disease burden. As per predictions from studies by the National Commission for Macroeconomics and Health, Government of India, the number of patients with CAD is set to increase over 60 million by 2015 (Indrayan A, 2005) [4].

Globally, cardiovascular diseases are the number one cause of death and they are projected to remain so. An estimated 17 million people died from cardiovascular disease in 2005, representing 30% of all global deaths. Of these deaths, 7.2 million were due to heart attacks and 5.7 million due to stroke. About 80% of these deaths occurred in low- and middle-income countries. If current trends are allowed to continue, by 2030 an estimated 23.6 million people will die from cardiovascular disease (mainly from heart attacks and strokes).

In CCU the patient and their relatives highly depend on doctors, nurses, hospital staffs and on hospital facilities. Besides, clinical management of patient is important to look after the service facilities for patient's confidence and satisfaction. A poorly designed CCU and overcrowding may increase the risk of occurrence of accidents e.g. Physical and psychological injuries. Therefore the aim of this study is to investigate the status of management of CCU in specialized hospital (NICVD).

1.2 Research Question

What is the management status of Coronary Care Unit in a specialized hospital?

1.3 Research Objectives

General objective

To assess the management status of Coronary Care Unit in a specialized hospital.

Specific objectives

1. To assess the management status of clinical and nursing service in the study unit.
2. To assess the management status of the supportive service.
3. To identify the availability of physical facility, lifesaving instrument and medication.
4. To assess the management status of utility service.
5. To find out the socio-demographic characteristics of the respondent

1.4 Limitations of the study

- In this study service recipients were not included because CCU patients were not allowed to interview as their unstable /serious condition. The study would have conveyed better result if their views are included.

- Sample size and sampling technique were not selected according to study design.

- The study covered only the management of Coronary Care Unit (CCU) in NICVD, hence it may not represent the situation of management at Coronary Care Unit of the entire Bangladesh as a whole.

2. METHODS AND MATERIALS

2.1 Study design: Descriptive cross sectional quantitative.

2.2 Study period: 12 months starting from January to December 2016.

2.3 Study place: Coronary Care Unit (CCU) in National Institute of Cardiovascular Diseases & Hospital (NICVD), Sheer-E-Bangla Nagar, Dhaka - 1207.

2.4 Study Population: All service providers working in the CCU of NICVD.

2.5 Sample Size Calculation: To determine the sample size the formula was:

$$n = \frac{z^2 pq}{d^2} = 384$$

We taken purposively 150 because there were 232 service providers available.

2.6 Sampling Technique: purposively by using the following inclusion criteria;

2.6.1 Inclusion criteria: Sample included purposively by using the following inclusion criteria; (a). only the respondents who were working in CCU for more than six months. (b). Respondents who were available on duty during data collection period.

2.7 Development of research instrument:

A semi structured questionnaire was prepared according to the objectives and variables of the study and make simple understandable to respondents. Observational checklist also prepared for taking information related to objectives.

2.8 Planned for data collection:

Before data collection pretesting was done among the service providers of CCU in DMCH to check the accuracy and degree of reliability of the questionnaire. The questionnaire was finalized after some modification and reviewed by the guide.

2.9 Procedure of data collection:

After approval of the proposal by the institutional review board, the thesis information letter from NIPSOM authority was submitted to the hospital director. After approval from the target setting, met with the in charge of the CCU in NICVD to explain the study objectives and data collection procedure. Then potential subjects who met the inclusion criteria followed by purposive sampling techniques were identified. According to plan, data was collected through face to face interview, record review and observation.

2.10 Data processing and analysis:

After data collection, data was checked, matching, verified, rearranged, edited and analyzed according to the specific objectives and variables by statistical package for social science (SPSS) 21.0 version.

2.11. Data presentation and interpretation: Through tables and graphs.

2.12. Ethical issues: After approval by the Institutional Review Board (IRB) NIPSOM, under the Bangobandhu Sheikh Mujib Medical University, Dhaka Bangladesh permission was taken from the director of NICVD for data collection. The subject who were willing to participate in this study was asked to sign a consent form. The subjects were assured that they had the right to refuse to participate in the study at any time. The identities of the subjects were coded in order to keep confidentiality and anonymities.

3.RESULT:**Distribution of Manpower status providing service at CCU in NICVD-**

In NICVD there are 16 Cardiology Medicine units for providing patients service. Patient admitted in CCU under head of the unit by rotation. An Assistant/

Associate Professor performs on call duty in his own unit admission day. On call Asst. Professor act as CCU in charge. There are 8 Professors, 15 Associate Professors, 17 Assistant Professors 6 Junior Consultants, 6 Registrars, 1 Resident Physician (R.P), 91 Medical Officers (MO) are included in 16 units. Manpower of a unit are -one head of the unit, 2-3 Assistant /Associate Professor /Consultant, and 4-6 Medical Officers. R.P prepares monthly duty roster of MO for managing CCU including whole Medicine ward of NICVD. Nursing staffs include two in charges and 60 nurses provide 8hrs shifting duty in 24hrs. Supporting staffs are 20 ward boy/Aya, 5 cleaners and 3 security guards maintain 24hrs duty.

In day shift there are 01 on call Assistant/Associate Professor /Consultant, 4 MO, 16-18 nurses, 6-7 ward boy/Aya, 3 cleaners and 2 security guard. In night shift there are same numbers of doctor 8 nurses, 6-7 ward boy/Aya, 2 cleaners and 1 security guard. In NICVD nurses work in CCU by rotation half yearly/annually/more. Supporting staffs work monthly by rotation in CCU. A medical technologist (Radiology) on call in 24hrs for potable x-ray and Temporary Peacemaker (TPM).

Table 1. Distribution of the respondents according to Socio-demographic status (n=150)

Variables	Characteristics	Frequency (n)	Percent (%)
Age group(in year) Mean SD 38.91 (± 5.24)	26 – 35	28	18.7
	36 – 45	109	72.7
	>45	13	8.7
Sex	Male	78	52
	Female	72	48
Religion	Muslim		80
	Hindu		14.
	Christian		5.3
Marital status	Married	147	98
	Unmarried	3	2
Designation	Medical officer	70	46.7
	Senior staff Nurse	44	29.3
	Staff Nurse	16	10.7
	Ward boy	15	10.0
	Cleaner	5	3.3
Educational Qualification			
Medical officer	MBBS	54	36
	Diploma in Cardiology	5	3.33
	FCPS (Cardiology)	1	0.66
	MD(Cardiology)	10	6.66
Nurse	Diploma in Nursing	37	24.66
	B.Sc. Nursing/PHN	19	12.66
	MPH/MSc Nursing	4	2.66
Ward boy	Primary	1	0.66
	Junior Secondary	11	7.33
Cleaner	SSC	3	2
	Can sign only	5	3.33
Length of service (in year)	1 - 5	14	9.3
	6 -10	62	41.3
	11 -15	45	30.0
	>15	29	19.4

Table 1 represents Socio-demographic status of the respondents. Here, out of 150 respondents (72.7%) were age group of 36-45 years and (8.7%) of the respondents were >45 years. (52%) were male and rest (48%) were female. Highest (80%) were Muslim, and lowest (5.3%) were Christian. (98%) were married and (2%) unmarried. (46.7%) were medical officer, (29.3%) senior staff nurse, (10.7%) staff nurses, (10%) ward boy and only (3.3%)

were cleaner by designation. Majority (77.1%) of the medical officers were MBBS, (36%) of nurses were Diploma in nursing (24.66%) ward boy completed JSC, all the cleaners could sign only. The length of service Mean was 11.5 (± 6.8) maximum 38 years, minimum 1 year.

Figure 1 represents Among all the respondents, majority (72%) experience were within 1 to 10 years, 20.7% respondents' experience were below 1 year, 6% were in 10 to 20 years and 0.7% of them were within 20 to 30 years and more than 30 years respectively.

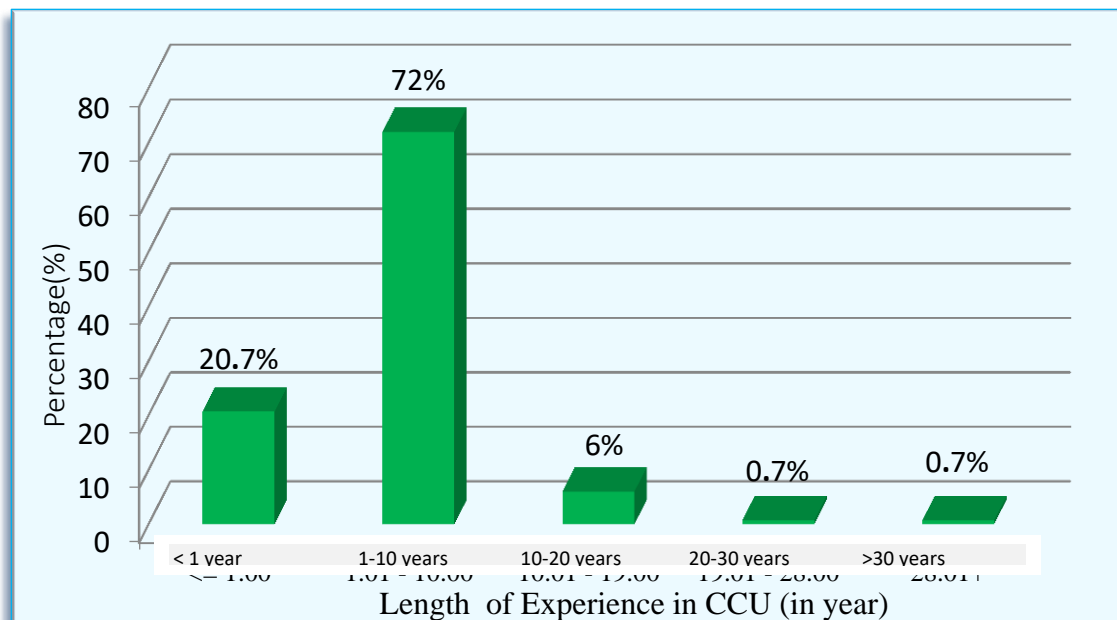


Figure 1. Distribution of respondents according to length of service in CCU (n-150)

Table 2. Distribution of respondents according to training on CCU

Variables	Response	Frequency (n)	Percent (%)
CCU training			
Medical officer	Yes	6	8.6
	No	64	91.4
Senior staff Nurse	Yes	20	45.5
	No	24	54.5
Staff Nurse	Yes	8	50.0
	No	8	50.0
Ward boy	Yes	7	46.7
	No	8	53.3
Duration of CCU training	<1 month	19	46.3
	1 to 6 months	21	51.1
	>6months	1	2.4
Place of training			
Medical officer	Foreign	00	00
	Local	06	100.0
Senior staff Nurse	Foreign	3	13.0
	Local	20	87.0
Staff Nurse	Foreign	1	12.5
	Local	7	87.5
Ward boy	Foreign	00	00
	Local	7	100.0

Table 2 represents respondents according to training on CCU. Among all the medical officer only 8.6% senior staff nurses 45.5% and (46.7%) Ward boys had CCU training. More than half (51.1%) of the respondents got 1to 6month training, 46.3% got <1 month training and 2.4% had >6month training. Medical officers and ward boy had 100% local training as well as senior staff nurses, 13% had foreign training and 87%% had local training and the

staff nurses had 12. 5% foreign and 87.5% local training. In the CCU of NICVD 28.3% service provider were trained up on CCU related training.

Table 3. Findings of observational service for the patient at CCU of NICVD

Service provider	Characteristics	Comments
Doctor's Service	Availability	Yes
	Maintain 8 hours duty	Yes
	Perform physical examination	Yes
	Co-operate with patient	Yes
	Provide legal information	Yes
	If necessary contact with other department	Yes
	Follow up the patient	Yes
Nursing Service	Availability	Yes
	Maintain 8 hours duty	Yes
	Observe the patient	Yes
	Record vital monitoring	Yes
	Give timely medication	Yes
	Co-operate with patient	Yes
	Politeness & sympathy	Yes
	Sincerity	Yes
	Maintaining sterilization	Yes
Supporting staff service	Availability	Yes
	Working skill	Yes
	Cleanliness	Yes
	Punctuality	Yes
	Courtesy	Yes
	Availability	Yes
Total service items-21		

Observational service for patient in the CCU of NICVD was 100%.

Findings of supportive & utility services:

All the respondents mentioned that laboratory investigations (Biomarker, Troponin-I,

ABG, CKMB, Lipid Profile, Serum creatinine) were done in the hospital. The questions were not applied for the cleaner. They mentioned that diagnostic procedures for CVD -Coronary Angiogram, Trans thoracic Echo, Trans esophageal Eco, Holter Monitor all these diagnostic procedure was done in the hospital, only CT scan and MRI was not available in NICVD. They mentioned that Medicine, equipment's and stationeries were 100% supplied by the hospital store adequately and timely. Their outlook were laboratory investigations and blood bank served in 24 hours for CCU. Social welfare provide support to the poor patient. The service providers mentioned that CCU blunt equipment's were sterilized by autoclave and gas and sharp equipment's were sterilized by Savlon and Lysol.

Table 4. Findings of the diagnostic service facilities available for the CCU in NICVD

Name of investigation	Present	Absent	Absent
Laboratory investigation (Essential)	Biomarker	✓	
	Troponin I	✓	
	CKMB	✓	
	Lipid Profile	✓	
	Arterial Blood Gas	✓	
	Serum Creatinine	✓	
Laboratory investigation (Non-Essential)	Complete blood count (CBC)	✓	
	Random Blood Sugar(RBS)	✓	
	Fasting Blood Sugar(FBS)	✓	
	Blood Grouping	✓	
Viral marker	HbsAg	✓	
	Anti HCV	✓	
	HIV	✓	
	Anti HEV	✓	
	Serum bilirubin	✓	
	Blood Urea	✓	
	Uric Acid	✓	

	Widal test	✓	
	BT.CT	✓	
	Urine RME	✓	
	Sputum AFB	✓	
	Blood Culture	✓	
Diagnostic Procedure	ECG (Electrocardiogram)	✓	
	Echocardiogram (Thoracic) TTE	✓	
	Echocardiogram (Esophageal) TOE	✓	
	Coronary Angiogram	✓	
	X-Ray	✓	
	24 hours Holter Monitor	✓	
	USG	✓	
	CT Scan		✓
	MRI		✓
	Total item-32	30(93.75%)	2(6.25%)

Diagnostic procedure for cardiovascular diseases of CCU in NICVD were 93.75% available, CT scan and MRI were not done which is only 6.25%.

Table 5. Distribution of respondent's observation and opinion on multiple services

Variables	Response	Frequency (n)	Percent (%)
Opinion about CSSD	Excellent	2	1.4
	Very Good	47	32.4
	Good	96	66.2
	Total	145	100.0
Diet supply	Highly satisfactory	3	2.1
	Satisfactory	139	95.8
	Poorly satisfactory	3	2.1
	Total	145	100.0
Laundry service	Highly satisfactory	2	1.4
	Satisfactory	139	95.9
	Poorly satisfactory	4	2.8
	Total	145	100.0
Security service	Excellent	2	1.3
	Very Good	43	28.7
	Good	105	70.0
	Total	150	100.0
WAY OF Wastes segregation	Color code	143	95.3
	Mixing	6	4
	Basin	1	0.7
	Total	150	100.0
Time of bed Linen change	Daily	72	49.7
	Every alternate day	4	2.8
	Per patient occupied	68	46.9
	When necessary	1	0.7
	Total	150	100.0

Table 5 represents (66.2%) respondents replied good, 32.4% very good and only 1.4% replied excellent regarding CSSD. Regarding quality diet supply, 95.9% responded satisfactory, 2.1% poorly satisfactory and highly satisfactory respectively. Out of 145 respondents, most 95.9% answered satisfactory, 2.8% were poorly satisfactory and 1.4% were highly satisfactory to opinion about laundry service. Among all, 70% replied security service was good, 28.7% very good, and only 1.3% replied excellent about security service. Most of the (95.3%) respondents' segregated waste according to color code, 4% mixing and 0.7% used basin. Nearly half (49.7%) of the respondents observation was daily, 46.9% per patient occupied, 2.8% every alternate day and 0.7% when necessary to change of bed linen.

Table 6. Findings of the availability of physical facilities in the CCU of NICVD

Physical facilities	38 Bedded	
	Requirement	Present
Doors	1	1
Windows	12	12
Beds	38	38
Doctor's room	2	2
Nurses room	2	2
Visitors lounge /Waiting Room	1	1
Nursing room	1	2
Store room	2	2
Clean and dirty Utility room	2	2
Toilet facilities for service providers	3	3
Toilet facilities for patients	2	2
Safe drinking water	2	2
Hand washing basin	2	2
Generator	2	2
Air cooler	2	2
Telephone	2	2
Fan	12	12
Total	89	89

The physical facilities were 100% available in the CCU of NICVD.

Table 7. Findings of the major equipment's available in CCU

Name of the equipment's	Requirement	Supply	Functional	Non-functional	
				Repairable	In-repairable
Multi-channel Monitor	38	50	41	4	5
Nebulizer	24	18	6	2	10
Syringe Infusion Pump	24	30	18	5	7
Biphasic External Defibrillator	3	26	9	9	8
ECG Machine	3	11	4	2	5
USG Machine	3	3	3		
Over bed table	38	38	38		
ICU Bed	38	38	38		
Ripple Mattress	38	38	38		
Ventilator standard	15	-	-	-	-
Ventilator	9	4	4	-	-
Portable X-Ray Machine	3	2	2		
Rapid Infusion Pump	9	3-	-	-	3
Temporary Pacemaker Set	2	1	1		
C-arm machine	1	1	1		
Pulse Ox meter	38	38	38		
Auto CPR Machine	3	3	3		
Central Monitor	2	2	2		
	291	306	246(84.5%)	22(7.6%)	38(13.06)

Major functional equipment's were 84.55% available, non-functional equipment's were 7.6% repairable in CCU of NICVD.

*Functional major equipment's were mostly (84.5%) available in the CCU of NICVD.

*Category of ancillary equipment of CCU were mostly (84.7%) available in NICVD.

* At the CCU of NICVD there has normally extra patients other than sanctioned beds.

Table 8. Findings of the Ancillary Equipment facilities available in the CCU

Name of the equipment	Requirement	Present	Fulfillment of requirement (%)
Trolley	15	10	66.7
AMBU-Bag and Mask	19	9	47.3
Laryngoscope with Blade	7	4	57.1
Glucometer	12	3	25.0
Emergency Medicine Tray	19	8	42.1
Refrigerator	3	1	33.3
Instrument Sterilizer	2	1	50.0
Ophthalmoscope	3	1	33.3
Emergency Light	15	7	46.7
Heater	2	1	50.0
X-Ray View Box	6	2	33.3
Suction machine	15	10	66.7
Computer	2	2	100.0
Tablet Crusher	2	2	100.0
Magnifying Glass	2	2	100.0
Portable spot light	6	6	100.0
Torch	6	6	100.0
Kidney Tray	60	70	116.7
Stethoscope	20	20	100.0
Scissors	12	12	100.0
Water Boiler	2	2	100.0
Medicine B			
	50	50	100.0
Drip stand	76	80	105.3
Hot water Bag	18	12	66.7
Steel Bowl	24	16	66.7
Needle destroyer	2	2	100.0
Cut Down Set	8	2	25.0
Instrument Tray	2	2	100.0
Sponge Holding Forceps	2	2	100.0
Mosquito Artery Forceps	12	12	100.0
Scissors	2	2	100.0
Venesection Hook	2	2	100.0
Allies Tissue Forceps	2	2	100.0
Needle Holder	2	2	100.0
Scalpel Blade No-15	2	2	100.0
B.P. Handle	2	2	100.0
Silk	2	2	100.0
	438	371(84.7%)	

The Ancillary equipment's were 84.7% available in CCU of NICVD.

Table 9. Findings of essential medication available in the CCU

Form	Name of medication	Weekly requirement	Weekly supply
Tablet	Clopidogrel	7200	7200
	Ecosprin	400	400
	Nitroglycerin	850	850
	Atovastatin	1100	1100
	Beta-blocker (atenolol)	250	250
	Amlodipine	120	120
	Metoprololtartate (Betaloc)	400	400
	Ramiril	350	350
	Carvista	400	400
	Diazepam	550	550
	Spironolactone(Ediloss)	700	700
Cap	Omeprazole	2400	2400

Inj.	Streptokynase	95	20
	Clexane (Enoxaprin)	300	35
	Frusimide	2000	2000
	Adrenaline	600	600
	Atropine	1150	1150
	Morphine	41	41
	Pethidine	80	80
	Hydrocortison	1300	1300
	Dextromethasone	70	70
	Dopamine	370	370
	Heparin	27	27
	Verapamil	105	105
	Vergon	220	220
Spray	Nitroglycerine	70	70
Infusion	Dextrose aqua	150	150
	Dextrose Normal saline(500ml)	300	300
	Normal saline	200	200

In NICVD most of (93.1%) essential medications were supply by hospital store according to weekly requirement of CCU. Only injection Streptokinase (21%) and inj. Enoxaprin (11.7%) were not supply according to weekly requirement.

*Non- essential medications were 100% supplied by hospital store according to weekly.

Table 10. Opinion of the respondents about overall management (n-150)

Variables	Response	Frequency (n)	Percent (%)
Cleanliness	Highly satisfactory	3	2.0
	Satisfactory	144	96.0
	Poorly satisfactory	3	2.0
	Total	150	100.0
Overall management	Highly satisfactory	2	1.3
	Satisfactory	142	94.7
	Poorly satisfactory	6	4.0
	Total	150	100.0
Problem faced during patient management (*Multiple responses)	Overload of patients	123	55.2
	Misbehavior of patient's attendance	34	15.2
	Insufficient manpower	55	24.7
	Inadequate medicine and equipment supply	9	4.0
	Pressure of visitors	1	.4
	Insecurity in CCU	1	.4
Recommendation for further improvement (*Multiple responses)	Increase number of bed	82	31.5
	Increase manpower	14	5.4
	Sufficient quantity of medicine and equipment	86	33.1
	Established healthy environment	52	20
	Need more training	22	8.5
	Need more security for service provider	4	1.5

Out of 150 respondents, the most 96% were satisfied, 2% a highly satisfied and poorly satisfied respectively about overall cleanliness. Majority, 94.7% were satisfied, 4% poorly satisfied and 1.3% highly satisfied regarding overall management. In the CCU of NICVD more than half (55.2%) of the service providers faced over load of patient, 24.7% insufficient manpower, 15.2% misbehavior of patient's attendants, 4% inadequate medicine and equipment's supply and 0.4% faced pressure of visitors and insecurity in CCU respectively as problem during patient management. Regarding recommendation for further improvement, 33.1% recommended to provide sufficient quantity of medicine and equipment, 31.5% increase number of bed, 20% recommended to established healthy environment, 8.5% to need more training, 5.4% increase manpower and 1.5% recommended need more security for service providers.

4. DISCUSSION

The study was undertaken to assess the management status of coronary care unit in specialized hospital (NICVD). In this chapter the findings of the study are discussed under the following heading:

Findings about the management status of Coronary Care Unit in NICVD

The study revealed that the Physical facilities in the CCU were 100% available. The major functional equipment's were mostly (84.5%) and ancillary equipment's of CCU were mostly (84.7%) available in NICVD. A similar study conducted by Begum N (2014-2015) Total quality management (TQM) at coronary care unit (CCU) in Dhaka Medical college Hospital. The percentage of previous study nearly (83.3) similar with this study.

Signifies the study the essential drugs was mostly 93.1% and Non-essential drugs for CCU in NICVD was 100% available. A similar study conducted by Begum N (2014-2015) Total quality management (TQM) at coronary care unit (CCU) in Dhaka Medical College Hospital. The essential drugs (77.62%) and Non-essential drugs (96.97%) available. This study results were higher than the previous study. The status of availability of the diagnostic service facilities findings was also same. This was consistent with the previous study conducted by (Begum N, 2014-2015) [5].

The study found that the respondents mentioned the laboratory investigations (Biomarker, Troponin-I, ABG, CKMB, Lipid Profile, Serum creatinine) are done in the hospital. This questions were not applied for the cleaner. All (100%) of the respondents mentioned that the laboratory investigations done in the hospital 24 hours. They reported that the Coronary Angiogram, Transthoracic Echo, Trans esophageal Eco, Holter Monitor all these diagnostic procedure was done in the hospital. All the respondents mentioned that Medicine, equipments and stationary were supplied by the hospital store. All service providers replied that blood bank facilities and social welfare provide support to the patients. All the respondents mentioned sterilized by autoclave and gas. These finding were not contrasted with previous study conducted by Begum N, 2014-2015 [5].

It was observed in the present study, all of the respondents answered that they had security guard service. Among all, 95.3% respondents practiced the way of wastes segregation according to color code, 4% mixing and only 0.7% that they used basin.

According to the present study, out of 150 respondents more than half (55.2%) faced overload of patients, 24.7% insufficient manpower, 15.2% misbehavior of patients attendance, 4.0% inadequate medicine and equipment's supply and .4% faced pressure of visitors and insecurity respectively as problem during patient management.

Another similar study conducted by Rashid MH on Total quality management of three Upazila health complexes. This was not consistent with present study (Rashid MH, 2014-2015) [6].

Findings about the socio-demographic characteristics of the respondents

The present study revealed that majority (60.7%) of the respondents were age group of over 36-40 years and almost 17.3% of the respondents were between 31 to 35 years age group. The mean age of the respondents was 38.91 years with standard deviation (SD) of ± 5.24 . Minimum age of the respondents was 26 and maximum age was 59 years. Among all, about half (52%) of respondents were male and rest (48%) of them were female. Majority (80%) service providers were Muslim, 14.7% were Hindu and only 5.3% were Christian. Most 98% respondents were married and only 2% of them were unmarried. These findings were nearly similar with the previous study conducted by Dr. Ahmed R, 2013-2014 NIPSOM on Emergency Management Service for Cardiovascular Patient in NICVD which mean age was 40.31 $SD \pm 5.81$.

Signifies the study, out of 150 respondents nearly half (46.7%) of them were Medical Officer, 40% were Nurses, 10% were ward boy and only 3.3% were cleaner by designation. Among all, more than half (77.1%) of the medical officers' educational qualification were MBBS, 14.3% were MD (Cardiology), 7.1% of them were Diploma in Cardiology and only 1.4% were FCPS (Cardiology). Among all the nurses 61.7% of them were Diploma in Nursing, 31.7% were B.Sc Nursing /PHN and only 6.7% of them were MPH/MSc in Nursing.

Among all the ward boys, 73.3% were JSC, 20% were SSC and only 6.7% were Primary pass. All the cleaners could sign only. The previous study was conducted by Dr. Ahmed R (2013-14) NIPSOM on Emergency Management Service for Cardiovascular Patient in NICVD which was 23% Medical Officer, 33% Nurses, 31% ward boy/Aya, 13% Assistant register (Ahmed R 2013 -202014) [7].

The present study revealed that the length of service within 6 to 10 year were 41.3%, 30% of respondents' service length was within 11 to 15 years and 10.7% respondent were within the range of 16-20 years of service length, 9.3% respondents were within the group of 1-5 years of service length, 4.7% were 26 to 30 years, 1.3% were within 36 to 40 years, 2.0% were within the age group of 21-25 years and 26-30 years 0.7% were within 31 to 35 years. Maximum service length was 38 years and minimum was 1 year. Among all the respondents, majority (72%) experience were within 1 to 10 years, 20.7% respondents' experience were below 1 year, 6% were in 10 to 20 years and 0.7% of them were within 20 to 30 years and more than 30 years respectively.

Among all the respondents, majority (72%) experience were within 1 to 10 years, 20.7%

respondents' experience were below 1 year, 6% were in 10 to 20 years and 0.7% of them were within 20 to 30 years and more than 30 years respectively. These findings were nearly consistent with the previous study conducted by Begum N (2014-2015) [5].

According to this study most (91.4%) of the Medical Officers had no CCU training, only 8.6% had CCU training. Among all the senior staff nurses, about half 53.3% had no training on CCU and 46.7% had CCU training. Among all the ward boys, 53.3% had no training on CCU and only 46.7% had CCU training. No cleaners had training on CCU. Among all the CCU trained staffs, 51.1% had 1-6month training, 46.3% had <1 month training and 2.4% had .6month training. In CCU of NICVD 28.3% service providers were trained up on CCU management.

Findings about the satisfaction level of the respondents

Service providers play an important role in management of hospital service. So, their satisfaction is an important parameter for assessing the quality of services. The level of satisfaction was measured on a 1- 4 Likert Scale. The present study revealed that more than half (67.3%) of the service providers replied good, 31.3% very good and only 1.3% replied excellent regarding CSSD. Among all, regarding quality diet supply, majority (95.9%) responded satisfactory, 2.1% poorly satisfactory and highly satisfactory respectively. Nearly half (48.7%) viewed per patient occupied, 48% daily, 2.7% told every alternate day and 0.7% when necessary to change of bed linen. Among all, 96% were satisfactory, 2.7 were poorly satisfactory and 1.3% were highly satisfactory to opinion about laundry service. Among all, 70% opinion was good security service, 28.7% very good, and only 1.3% responded excellent about security service. A similar study conducted by Begum N (2014-2015) .Total quality management (TQM) at coronary care unit (CCU) in Dhaka Medical college Hospital. The security services were much higher than in contrast with the present study (Begum N, 2014-2015) [5].

It was observed that in this study majority (96%) responded the overall cleanliness were satisfactory and 2% were highly satisfactory and poorly satisfactory respectively. According to this study 94.7% respondents responded satisfactory, 4% poorly satisfactory and 1.3% highly satisfactory regarding overall management. These findings were nearly contrast with the previous study conducted by Begum N.

The present study signified that 33.1% service providers recommended to provide sufficient quantity of medicine and equipment, 31.5% to increase number of bed, 20% to established healthy environment, 8.5% recommended need more training, 5.4% increase manpower and 1.5% need security of service provider for further improvement of CCU.

5. CONCLUSION & RECOMMENDATIONS

A cross sectional study entitled "Management of Coronary Care Unit in a Specialized Hospital" was conducted among 150 service provider to assess the management status of CCU in NICVD. The study revealed that physical facilities, lifesaving instruments and medications were mostly available in CCU. Clinical service were provided hundred percent by service provider. In CCU of NICVD about one third of service providers were trained up on CCU management. Almost all of the diagnostic procedure for CVD were performed in the hospital. Nearly all of the respondents mentioned that supportive and utility service were satisfactory. About two third of the respondents replied CSSD and security service persisted good. Majority of the service provider's attitude of waste segregation was color coding. Nearly all of them satisfied about overall cleanliness and management of CCU. About half of the service provider faced overload of patient, one forth insufficient manpower and misbehavior of patient attendants, and few of them faced inadequate medicine and equipment's as problem. One third of service provider's recommendation for further CCU improvement was increase manpower and CCU bed. One forth recommended establishing healthy environment and increasing CCU training facilities. Finally the study revealed that the CCU management of NICVD was satisfactory with some recommendation by the service providers.

On the basis of the findings and related discussion the following recommendations are put forward to the health policy makers of Bangladesh which may be taken as base line information for further activities to improve the CCU management services for cardiovascular patients in a specialized hospital.

- The number of beds and manpower in the CCU should be increased to meet the growing need of the unit.
- Sufficient supply of medicine and equipment's would be increased for management of extra patients other than sanction bed.
- Healthy environment may be established for better management of CCU patients.
- Arrange overseas and in country training on CCU management for physician and nurses.

Acknowledgement

At first, I would like to express my sincere thanks to all Doctors, Nurses, supporting staffs and the authority of National Institute of Cardiovascular Diseases and Hospital (NICVD) for their constant participation and fidelity to this study. My research would never have been possible without their wholehearted support and full cooperation. I wish to offer my most sincere gratitude to my respected supervisor Dr. Fahmida Akter Assistant Professor department of Epidemiology, National Institute of Preventive and Social Medicine (NIPSOM), Mohakhali, Dhaka. I am grateful to my Director, Head of the Department of

Public Health and Hospital Administration and thesis Committee Members (NIPSOM).

CONFLICT OF INTEREST

None to declare.

6. REFERENCES:

[1]Wikipedia, the free encyclopedia (2016) Coronary care unit (CCU)).[Online] available from https://en.wikipedia.org/wiki/Coronary_care_unit_%28CCU%29

[2]Ala Alwan (2011) World Health Organization; Geneva: 2011. World Health Organization. Global Status Report of NCD 2010. [Online] available from http://www.who.int/nmh/publications/ncd_report_full_en.pdf Accessed 4.6.13.

[3]Registrar General of India (2009). Ministry of home Affairs; New Delhi: 2009. Report on Causes of Death in India 2001–2003. [Online] available from http://www.cghr.org/wordpress/wp-content/uploads/Causes_of_death_2001-03.pdf Accessed 1.05.13.

[4]Indrayan A (2005) Ministry of Health and Family Welfare; Forecasting Vascular Disease Cases and Associated Mortality in India. Reports of the National Commission on Macroeconomics and Health. [Online] available from [www.whoindia. Org / EN/Section102/Section201_888.htm](http://www.whoindia.org/EN/Section102/Section201_888.htm) Accessed 4.06.13.

[5]Begum N (2014-2015) *Total quality management (TQM) at coronary care unit (CCU) in Dhaka Medical college Hospital*. Unpublished research; NIPSOM, Mohakhali, Dhaka.

[6]Rashid M H (2014- 2015) Total quality management of three upazila health complexes. Unpublished research; NIPSOM, Mohakhali, Dhaka.

[7]Ahmed R (2013-14) Emergency Management Service for Cardiovascular Patient in a Specialized Hospital NIPSOM, Mohakhali, Dhaka.