RESEARCH PAPER

Status of Quality and Compliance to Inpatient Quality Indicators and Patient Safety Indicators in a Selected Private Corporate Hospital at Dhaka City Bangladesh

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Abstract

Bacground: The stutus of quality and compliance to inpatient quality indicators (IQIs) and patient safety indicators (PSIs) in corporate hospitals at dhaka city Bangladesh are not known as they are not adequately studied.

Objective: The present descriptive cross-sectional study was therefore undertaken to know the status of quality and compliance to selected IQIs and PSIs in a selected private (corporate) hospital at Dhaka City Bangladesh. The period of study and hospital data collection period were May to August 2019 and January to March 2019 respectively.

Methods: Selected IQIs and PSIs developed by Agency for Healthcare Research and Quality (AHRQ), USA and hospital facilities utilization parameters were investigated. Data were collected using questionnaires and checklists for the period of January to March 2019 from the purposively selected private (corporate) hospital. Sociodemographic information of randomly selected junior doctors and nurses were taken. Randomly selected senior clinicians, nurses and executives were interviewed regarding knowledge about selective IQIs, PSIs, JCIS, ISO relevant to quality healthcare. Data were analysed by SPSS programme version 20.

Results: The hospital has all relevant admistrative and clinical departments, bed patterns and has efficient admission and discharge processes for inpatients. Bed utilization was 87.5% of total 159 available beds. Patients visited OPD: 2434 per day, admitted: 28 per day and discharged with successful outcome: 27 per day. Average length of stay (ALS), hospital acquired infection (HAI) and hospital deaths were 3.6 days, 1.76% (18/1000 cases), and 124 (01 per day) respectively during data collection period. Tests done in Laboratory Medicine were 267637 with Clinical Biochemistry tests highest (51.21%) and investigations in Radiology-Imaging departments were 74997 with X-rays being highest (40.22%). Of the five selected IQIs, total CABG cases done were 191 with 04 hospital deaths i.e. 2.1% (21 per 1000 cases) and total AMI cases done were 140 with 12 hospital deaths i.e. 8.5% (85 per 1000 cases). No casualties were reported for caesarean deliveries or primary/normal deliveries. None of the five selected PSIs were traced over the data collection period.

Conclusion: These findings suggested that the selected hospital's services were demanding and it was concerned about quality healthcare services. However, comparative studies with other private corporate hospotals at Dhaka City including larger number of respodents are warrented.

Keywords: IQIs, PSIs, Hospital, Patients, Quality, Compliance

Introduction

Medical & Health Care services are undergoing profound changes in recent times all over the world including Bangladesh. Better health leads to better productivity in all fronts of life in the society and the

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country as a whole. However, there are rather over supply of services, making the operating environment increasingly competitive and huge capital investments are required.[1,2] Donabedian defined quality as a reflection of values and goals current in the medical care system or a corporate hospital and in larger society of which it is a part. It was stated that patient care cannot be considered as a unitary concept; it seems likely that there will never be a single comprehensive criterion by which to measure the quality of patient care.[3-5]

Experts in the subject defined "quality" in many ways. Healthcare Institute of Medicine (IOM) defines "Quality of Care" as: the degree to which health services for individuals and populations increase their likelihood of desired health outcomes and are consistent with current professional knowledge.[6,7] Total Quality Management (TQM): TQM is an organization-wide management strategy / philosophy / program aiming at embedding awareness of quality among all staff and at involving every process of the organization in a cycle of continuous improvement with the aim of satisfying the customers' needs and expectations.[6,7,8]

Many advantages are gained by frequently using outcome as the criterion of quality in medical care. Outcomes remain the ultimate indicators of the effectiveness and quality of medical care.[4,5] In this context, hospital statistics in terms of utilisation and monitoring of facilities are vitally important also. Avedis Donabedian was one of the first to view healthcare as a system composed of structure, process, and outcome; He believed that quality of care is not only related to each of these elements individually, but also to the relationships among them. Outcomes refer to the results of care, whether adverse or beneficial. Outcomes are classified as: (i) Clinical: (e.g.) mortality, complications, and adverse events, (ii) Functional: (e.g.) Ability to perform activities of daily living, (iii) Perceived: (e.g.) Patient satisfaction, (iv) Financial: (e.g.) Cost savings, (v) Utilization: (e.g.) Productivity, Average length of stay (ALS)/Length of stay (LOS).[6,7]

The inpatient quality indicators (IQIs) and patient safety indicators (PSIs) developed by the Agency for Healthcare Research and Quality (AHRQ) in collaboration with Evidence –based Practice Centre (EPC), USA from 1998-2002 are important to understand, implement and follow their effectiveness to maintain quality of the health/medical care services in private corporate hospitals.[3,9,10] In 2010 the process of care indicators (PCIs) were develop by centre for Medicare and Medicaid services (CMS), in collaboration with other organizations in USA.[10,11] The IQIs are a set of 32 indicators of hospital quality of care. The IQIs identify quality topics for monitoring and performance improvement. The PSIs are a set of indicators for adverse events that patients may experience as a result of exposure to healthcare system in the hospital. There are 22 PSIs divided into two different areas i.e. provider level and area level. CMS has proposed 10 PCIs including acute

myocardial infarction (AMI), congestive heart failure (CHF) and pneumonia, although additional measures (indicators) were added to them over time.[11,12] A number of studies have established the importance of organizational factors and processes of care while evaluating performance and quality of care in hospitals.[13,14] The IQIs, PSIs and PCIs are measured using hospital administrative data/ discharge sheet compliance to IQIs, PSIs and PCIs are important in determining quality of care provided by private corporate hospitals.[10,11]

Many studies were done and reported in literature about the applications the IQIs and PSIs identified by AHRQ, USA. These studies quantified the IQIs and PSIs in comparing hospital performances in delivering quality inpatient care.[15-21] Bangladesh has set an extraordinary example of gaining good health at low cost and has been projected as a model for other developing countries in the region. However, no study was reported in the literature investigating compliance to IQIs and PSIs relevant to assessing quality of health care services in private corporate hospitals of Dhaka City, Bangladesh.[22,23]

By and large, outcome remains the ultimate indicators of the effectiveness and quality of medical care. However, most healthcare compliance issues relate to patient safety, the privacy of patient information and quality of healthcare services in terms of inpatient management (admission and discharge/transfer) processes at affordable cost.[24,25] The PCIs are invariably included within the IQIs and PSIs. In fact, seven pillars of medical and health care suggested by Donabedian define its quality i.e. (i) efficacy, (ii) effectiveness (iii) efficiency, (iv) optimality, (v) acceptability, (vi) legitimacy and (vii) equity. Consequently, health care professionals must take into account patient preferences as well as social preferences in assessing and assuring quality.[4,26-28] Since then several processes of total quality management (TQM) for hospitals have been developed. Some of them are 5S-TQM, Kaizen (small) process and Kaizen (large) process, etc linking with Plan-Do-Check-Act (PDCA) cycle which lead to improved productivity and quality.[5,29,30]

As outcome remains the ultimate indicator of the effectiveness and quality of medical care, hospital statistics for utilization are vitally important. In a private corporate hospital, compliance as an outcome is especially important particularly compliance to IQIs

and PSIs. Effective corporate compliance should be an ongoing process leading to establishment of a compliance programme to help govern policies and compliance in an organization.[24,25] Among the indicators for quality and safety, IQIs and PSIs in hospitals have been studied extensively in USA. It is important to study and know the status of compliance to IQIs and PSIs in private corporate hospitals of a country or a geographical location. Literature reviewed has indicated that only few studies have been reported regarding compliance to these indicators in South East Asian countries but not included Bangladesh.[20,21] Therefore, the present study was conducted to find out "Status of Quality and Compliance to selective IQIs and PSIs in a selected private corporate hospital at Dhaka City Bangladesh".

Materials and Methods

Study Design: Descriptive cross sectional study;

Study Area: A selected private corporate hospital at Dhaka City, Bangladesh.

Study Population: Inpatients and healthcare providers of the selected private corporate hospital.

Inclusion Criteria: A private (corporate) non- teaching hospital.

Exclusion Criteria: Teaching hospitals and hospitals having < 150 beds and operating for < 2 years in Dhaka City.

Study Period & Duration: Four months, i.e. 01 May to 31 August 2019.

Hospital Data Collection Period: 01 January to 31 March 2019;

Sample Size: As the hospital was selected purposively, considering the inclusion and exclusion criteria, sample size calculation was therefore not required; Doctors and Nurses involved in the care process of the selected hospital were randomly included.

Sampling Technique: All medical records of the inpatients kept in Medical Records Department (MRD) were taken as samples. The knowledge labels of healthcare providers regarding quality healthcare/ medical care services and safety of patients were determined; *Independent Variables:* (i) Process of inpatient care - Structural features and processes of care related variables, Sociodemographic related variables of service providers, (ii) Quality care related

variables: IQIs/Selective - IQI 12/Coronary artery bypass graft (CABG) mortality rate, IQI 15/Acute myocardial infacrtion (AMI) mortality rate, IQI 26/ Coronary artery bypass graft (CABG) rate, IQI 21/ Cesarean delivery rate uncomplicated, IQI 33/Primary cesarean delivery rate uncomplicated; PSIs/Selective – PSI 06/Iatrogenic pneumothorax rate, PSI 13/ Posoperative sepsis rate, PSI 17/Birth trauma-injury to neonate rate, PSI 18/Obstetric trauma-vaginal delivery with instrument rate, PSI 19/Obstetric trauma-vaginal delivery without instrument rate; (iii) Knowledge and attitude of healthcare providers related variables – Inpatients management processes related variables, Knowledge of healthcare providers about IQIs & PSIs related variables.[9-12,31,32]

Dependent Variables: Quality care related variables of the hospital, Compliance to and rates for quality care indicators i.e. IQIs & PSIs. PCIs are invariably and automatically included within IQIs & PSIs and hence, separate investigation of them would be a repetition.

Data Collection Methods: Data were collected by interviewer administered (i) Questionnaire, (ii) Check list prepared in advance from hospital records, documents and discharge sheets; (iii) Questionnaires were pretested in a selected number of healthcare providers in a corporate hospital. The selected IQIs and PSIs as stated above were listed and check lists were prepared accordingly. The key/relevant senior personnel as well as some junior doctors and nurses were interviewed to find out the process of care and confirm the hospital statistical data and determine the knowledge about, and compliance to, IQIs and PSIs of the service providers. The questionnaires/ check lists consisted of five areas i.e. (i) Structural features and processes of care related variables, (ii) Sociodemographic and job related questionnaires (For Junior Doctors & Junior Nurses), (iii) Quality care (IQIs & PSIs) related questionnaires (For Senior Doctors, Nurses and Executives), (iv) Variables for utilization of hospital facilities (Period: January to March 2019), (v) Calculation of rates for, and compliance to, IQIs & PSIs (Period: Janury to March 2019).[10,33-38] Data were obtained from the MRD, IT Department (ITD), Human Resources Department (HRD), Quality Assurance Department (QAD), Infection Control Department (ICD), Laboratory Manager and OT Manager. The time taken for interview varied from 20-25 minutes with an average of about 22 minutes.

Data Management: Data collected for the period from January to March 2019 were checked thoroughly for any error or information missing and then analyzed accordingly.

Data Analysis: Data were analyzed by Microsoft Word-7, Microsoft Excel-7 and SPSS Programme-version 20 and were presented in the form of simple frequency distribution i.e. mean, standard deviation, percentage, figure, etc.

Ethical Consideration: Approval was taken from the Ethical Review Committee (ERC) at State University of Bangladesh (SUB) before starting the study i.e. collection of data; Administrative permission was obtained from the authority of the selected hospital; Verbal informed consents were taken from the healthcare providers; The information given by the respondents were analyzed using code numbers to maintain confidentially; Participant's right to refuse or withdraw from the study during the data collection period was accepted.[39]

Results

In the present descriptive cross-sectional study, structured questionnaires and check lists prepared in five areas were used to collect data from the selected hospital and the results are presented chronologically below.

Structural Features and Processes of Healthcare Related Information: The selected private corporate hospital has its own land, purpose-built building, parking space for 100 cars and 4 ambulances with sound organogram. It has all Clinical Specialties as well as Laboratory Medicine and Radiology-Imaging Departments. It has standard processes and procedures for admission and discharge of inpatients as presented in Figure 1 and Figure 2 respectively. Out of total 159 beds available for inpatients, 49 are single cabins and rest of the beds are on twin share basis or multiple bed cabins; for post operative care, 20 beds are earmarked. In addition, there are 21 observation beds in OPD for Day Care Surgery, Dialysis and Chemotherapy. *Postoperative beds are commonly used in Surgery Department from where patients are discharged. The staff situation in various areas of services i.e. Clinical Departments, Radiology & Imaging and related departments, Departments of Laboratory Medicine and related departments and Nursing Department are stated in Table I, Table II and Table III respectively.

Among the 275 nursing staff, 53.45% (n=147) were Senior/Staff Nurses, Junior Nurses were 10.18% (n=28) and Trainee Nurses were 35.27% (n=97). They work under the guidance of Matron/HOD (n=1) and Nursing superintendents (n=2).

(ii) Socio demographic and Job Related Information of Junior Doctors and Nurses: The age range of junior doctors was 21-40 years with Mean age+-SD: 30+-08 years. Of them, 62.5% (n=5) were between 21-30 years and the rest 37.5% (n=3) were between 31-40 years. Majority had Islam (75%, n=6) followed by Hisduism (25%, n=2) as the religion. Most of them had smaller family size with 2-4 members (75%, n=6) and 25% (n=2) belonged to larger family size with5-7 members. About length of services, 4 (50%), 1

Table I: Distribution of Physicians in Clinical Departments (n=159)

Level of Staff (Total)	Departments*					
	A%	B%	C%	D%	E%	Total %
Consultant (Full Time)	15 (53.6)	09(32.1)	04(14.3)	-	-	28(100)
Consultant (Part Time)	20 (68.9)	08 (27.6)	01(3.5)	-	-	29 (100)
Registrar	-	02 (25.0)	06 (75.0)	-	-	08 (100)
Assistant Registrar/ In-charge	02 (40.0)	01 (20.0)	01 (20.0)	01(20.0)	-	05 (100)
Senior Medical Officer (SMO)	04 (66.6)	01 (16.7)	-(0.0)	-(0.0)	01 (16.7)	06 (100)
Medical Officer	34 (41.0)	25 (30.1)	11 (13.2)	07 (8.5)	06 (7.2)	83 (100)
Total	7547.1	4628.9	2314.5	085.1	074.4	159 (100)

*A: Internal Medicine; B: Surgery; C: Obstetrics & Gynecology; D: NICU; E: Dialysis, Urology & Oncology; The above Table depicts that out of 159 physicians, 18.1% (n=29) are part time employees.

Table II: Distribution of Staff of Radiology-Imaging & Related Departments (n=114)

Level of Staff (Total)	Radiology – Imaging & Related Departments*						
	A	B	C	D	E	F	Total (%)
Sr Consultant	05	-	-	-	-	-	05 (4.38)
Consultant	02	05	03	01	02	01	14 (12.28)
RMO	-	-	-	-	02	01	03 (2.63)
Sr Radiographer	02	-	-	-	-	-	02 (1.75)
Radiographer	03	-	-	-	-	-	03 (2.63)
Scientific Officer	-	-	-	-	-	01	01 (0.87)
Physicist	-	-	-	-	-	-	03 (2.63)
Sr Med Technologist	-	-	-	-	-	03	-
Med Technologist	03	-	-	-	-	-	03 (2.63)
Executive	02	02	-	-	-	02	06 (5.26)
Sr Technician	01	07				-	08 (7.03)
Technician	01	21				01	23 (20.17)
Attendant	06	01				01	08 (7.03)
MLSS	01	06				-	07 (6.15)
Front Desk Accountant	16						16 (14.05)
Sr Executive	03						03 (2.63)
Executive	09						09 (7.89)
Total	54	42	03	01	04	10	114
%	47.4	36.9	2.6	0.9	3.5	8.8	100

*A:Radiology-Imaging; B:USG; C:ECHO+ETT; D:ECHO; E:ETT; F:Nuclear Medicine
The Table shows staff situation in Radiology-Imaging and related departments with highest in Radiology-Imaging (47.36%) followed by USG (36.85%) and others.

Table III: Distribution of Staff in Departments of Laboratory Medicine, Medical Molecular Biology & PCR and Pharmacogenetics (n=125)

Staff Level	Laboratory Medicine*					MMB& PCR	Phrgen	SC&P	Total %
	A	B	C	D	E	F	G	H	
Laboratory Director	01							-	01 (0.8)
Sr Consultant	-	-	-	-	-	-	-	-	-
Consultant	04	03	03	01	01	02	02	-	16 (12.8)
Manager & In-charge	01							01	02 (1.6)
Assistant Manager	01							01	02 (1.6)
Deputy Manager QA	01							-	01 (0.8)
Executive	01							01	02 (1.6)
Sr Sc Officer (SSO)		06	-	-	-	01	-	-	07 (5.6)
Scientific Officer(SO)		02	-	04	-	03	02	-	11 (8.8)
Sr Med Technologist	-	-	-	-	-	-	-	-	-
Med Technologist	10	22	-	03	05	01	01	03	45 (36.0)
Computer Composer	05	04	-	01	01	02	-	11	24 (19.2)
Laboratory Assistant	-	-	-	-	01	-	-	-	01 (0.8)
Technician	-	-	-	-	-	-	01	-	01 (0.8)
Lab Attendant	-	-	-	-	-	-	-	12	12 (9.6)
Total	24	37	03	09	08	09	06	29	125
%	19.4	29.5	2.4	7.2	6.4	7.2	4.8	23.1	100

*A: Clinical Pathology; B: Clinical Biochemistry & Clinical Immunology (Automation); C: Laboratory Hematology; D: Clinical Microbiology; E: Cytology & Histopathology; F: Medical Molecular Biology & PCR; G: Pharmacogenetics; H: Sample Collection & Process.
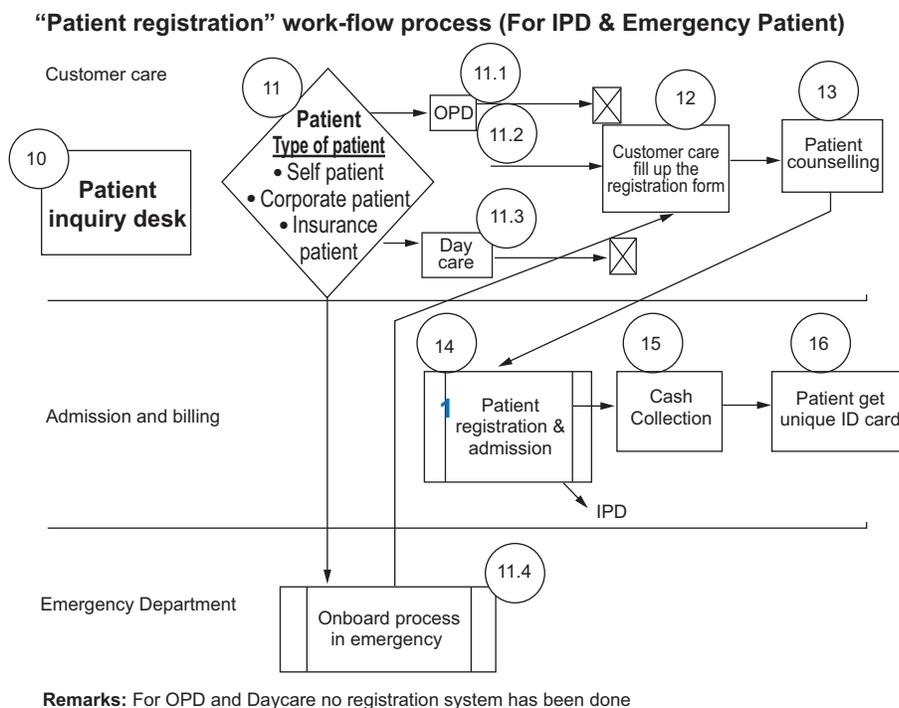
"Patient registration" work-flow process (For IPD & Emergency Patient)

Remarks: For OPD and Daycare no registration system has been done

Figure 1: Patient flow process of OPD in the selected hospital (Admission Process).
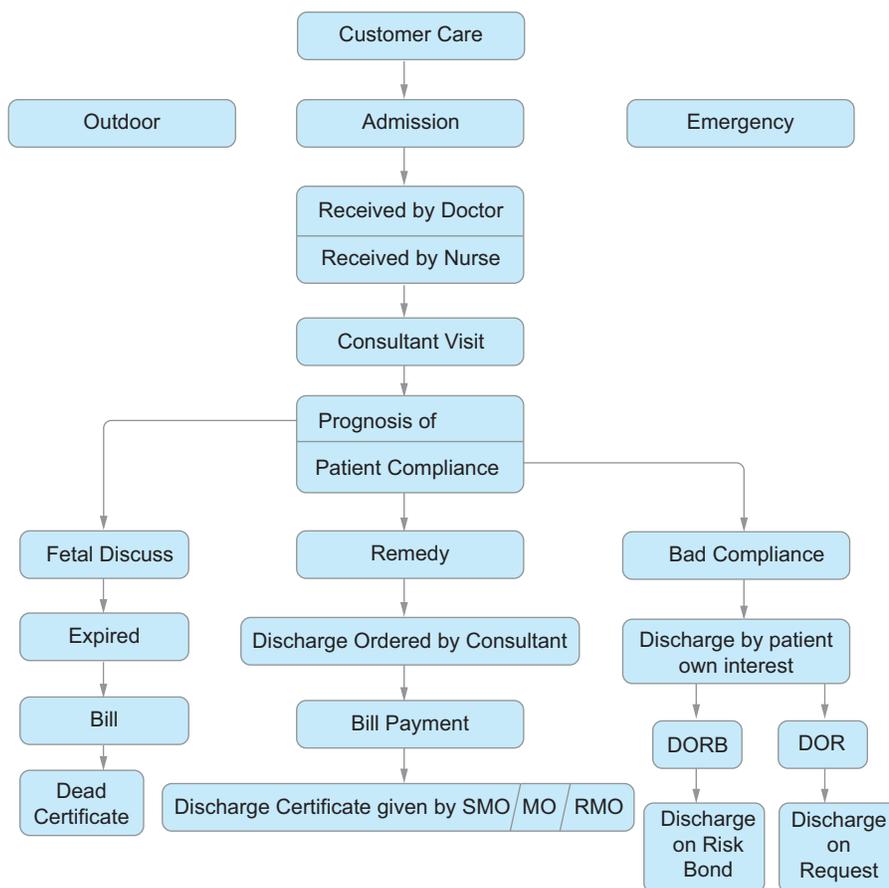

Figure 2: Discharge flow process of inpatients in the selected hospital : For discharge, a patient needs little time for completing all necessary formalities including payments (Discharge Process).

(12.5%) and 3 (37.5%) had 2-5 years, 6-9 years and >10 years of professional experience respectively. Among them, 6 (75%) had been serving at the selected hospital for 2-5 years and 2 (25%0 for >10 years. The distribution of them by job related information are presented in Table IV.

Regarding educational staus, 75% (n=6) of them were graduate and 25% (n=2) had postgraduate qualification. Among them, 62.5% (n=2), 25% (n=2) and 12.5% (n=1) were Junor Medical Officer, Senior Medical Officer and Junior Consultant respectively. Duty hours were 48 hours regular for 62.5% (n=5) and rotatory for 37.5% (n=3) junior doctors. About of likeness of job/nature of work, majority of them (62.5%, n=5) answered 'Yes with reservation' and rest (37.5%, n=3) 'Yes' only.

The age range of junior nurses was 21-38 years with Mean+- SD: 26+-9 years. Among them, 50% (n=4) were within 21-32 years and 50% (n=4) were within 33-38 years of age range. Majority were Muslims (62.5%, n=5) followed by Hinduism (25%,n=2) and Christianity (12.5%, n=1). Majority of them (62.5%, n=5) had smaller family size having 2-4 mmbers and 37.5% (n=3) had larger family size with 5-6 members. All of them (100%, n=8) were females and 75% (n=6) were married. Regarding job related information, most of them (62.5%, N=5) had <2 years and rest (37.5%, n=3) had 3-5 years experience after Diploma in Nursing. Among them, 62.5% (n=5) and 37.7% (n=3) had been serving at the selected hospital for >10 years and <2 yearts respectively. The distribution of these junior nurses by other job related information including educational background, job status, duty hours and liking of job/work at the hospital are stated in table V.

High proportion of nurses answered clearly 'Yes' and only 12.5% (n=1) replied 'Yes with reservation'about nature of job/work liking which were opposite and contrary to junior doctors. That was vitally important for nursing profession and for quality healthcare/ hospital services.

Table IV: Distribution of Junior Doctors by Other Job Related Information (n=8)

Educational status*	Frequency (n)	Percentage (%)
Graduate	6	75
Postgraduate	2	25
Total	8	100
Job status*	Frequency (n)	Percentage (%)
Junior Medical Officer (JMO)	5	62.5
Senior Medical Officer (SMO)	2	25.0
Junior Consultant (J&C)	1	12.5
Total	8	100
*All the respondents were familiar with Computer handling		
Duty hours	Frequency (n)	Percentage (%)
Regular, 48 hours	5	62.5
Rotatory, 48 hours	3	37.5
Total	8	100
Liking of Job/Nature of work	Frequency (n)	Percentage (%)
Yes	3	37.5
Yes, but with reservation	5	62.5
Total	8	100

Table V: Distribution of Junior Nurses by Other Job Related Information (n=8)

Educational status*	Frequency (n)	Percentage (%)
SSC	Training	62.5
Diploma in Nursing	2	25.0
BSc in nursing	1	12.5
Total	8	100
*None were with postgraduate qualifications		
Job status *	Frequency (n)	Percentage (%)
Junior Staff Nurse (JrSN)	5	62.5
Senior Staff Nurse (SrSN)	2	25.0
Trainee Nurse (TrN)	1	12.5
Total	8	100
*All the respondents were familiar with Computer handling		
Duty hours	Frequency (n)	Percentage (%)
Regular, 48 hours	5	62.5
Rotatory, 40 hours	3	37.5
Total	8	100
Liking of Job/work	Frequency (n)	Percentage (%)
Yes	7	87.5
Yes, but with reservation	1	12.5
Total	8	100

(iii) Regarding distribution based on information about knowledge for quality healthcare/hospital services relevant to IQIs and PSIs of Senior Doctors, Nurses and Executives (n=16), the results indicated that a large proportion of the professionals have knowledge about the healthcare quality indicators i.e. IQIs and PSIs as noted down in table VI.

(iv) Utilization Parameters of Hospital Facilities (January to March 2019) are presented in table VII and table VIII. Table VII shows the inpatient bed occupancy pattern 87.5% (n=139/159) for a day. The hospital had 159 approved beds which are regularly used for occupation by patients and in addition, 21 beds are held for day care. A total of 300 beds have been sanctioned for it by the regulatory authority of Bangladesh for future use. Some utilisation parameters of the hospital during the study period of January-March 2019 stated in table VIII showed that total of 2,19,645 (2434 per day) patients attended OPD and 2639 (29 per day) patients were hospitalized during the study period. Total number of bed days were 9245 and average length of stay (ALS) was 3.6 days. The frequency of investigations in Laboratory Medicine and Radiology-Imaging divisions are shown in Figure 3 and Figure 4 respectively.

Table VIII: Utilization Parameters of Hospital Facilities

*OPD: Outpatient Department; DORB: Discharge on risk bond.

(v) Incidence rates for, and compliance to, IQIs and PSIs are presented in table IX and table X respectively. Out of the total 191 CABG cases done during January to March 20-19, deaths were 04 (2,1%, 21/1000 cases) only. Similarly, 140 AMI cases were treated successfully with 12 casualties (8.5%, 85/1000 cases) only. Of the 117 cesarean deliveries, no casualties occurred and primary/normal/LUCs deliveries done were 07 cases only with no casualties i.e. 100% successful achievements (Table IX). The results stated in table X suggested that some difficulties were faced in MRD for tracing PSI in patients files/discharge sheets.

The above figure 3 bar diagram shows that Clinical Biochemistry tests were the highest (51.21%) followed by immunology & serology tests (25.35%) and laboratory hematology (14.15%) and others

The above figure 4 shows that out of 74997 investigations, x-rays constitute 40.22%, USG 18.91%, ECHO14.64%, ECG 13.98%, MRI 4.59%, CT Scan 4.4% and ETT 3.25%.

Table VI: Distribution of Senior Doctors, Nurses and Executives by Status of knowledge

Response to	Number (%) of Respondents		
	Correct	Incorrect	Total
Criteria of quality healthcare/medical service	16(100)	00(0.00)	16(100)
Quality healthcare assessed in your hospital	09(56.2)	07(43.7)	16(10 0)
CQI means/stands for	16(100)	00 (0.0)	16(100)
TQM means/stands for	16(100)	00 (0.0)	16(100)
QAP means/stands for	15(93.8)	01 (6.2)	16(100)
Idea on IQIs & PSIs of AHRQ, USA	06(37.5)	10(62.5)	16(100)
IQIs means/stands for	07(43.7)	09(56.3)	16(100)
PSIs means/stands for	07(43.7)	09(56.3)	16(100)
QAP present in your hospital or not	16(100)	00 (0.0)	16(100)
The members of QAP team in your hospital	13(81.2)	03(18.8)	16(100)
Intention to implement IQIs & PSIs monitoring in the hospital	11(68.8)	05(31.2)	16(100)
Quality of healthcare would improve if IQIs & PSIs monitoring are introduced regularly	14(87.5)	02(12.5)	16(100)
Best way a private (corporate) hospital may introduce IQIs & PSIs for quality healthcare and its monitoring effectively & efficiently	16(100)	00 (0.0)	16(100)
Average rate of successful outcome of patients in the hospital i.e. quality healthcare	14(87.5)	02(12.5)	16(100)
Quality of care would be improved & sustained if accredited by JCIS, ISO, etc;	13(81.2)	03(18.8)	16(100)
JCIS & ISO mean/stand for; Functions of JCIS & ISO?	11(68.8)	05 (31.2)	16(100)
Intention to get the hospital accredited by JCIS/ISO, etc & when your hospital	16(100)	00(0.0)	16(100)

Table VII: Bed Occupancy Pattern (Inpatients) for a Day

Room Category	Total	Occupied	Available
Deluxe Cabin/ Single Cabin	49	49	00
Twin Share	49	36	00
High Care	30	29	01
ICU(Intensive Care Unit)+ HDU (High Depen Unit)	14	06	08
NICU (Neonatal Intensive Care Unit)	10	06	04
Postoperative (L-3)*	12	09	03
Postoperative (L-4)/Gynae & Obs*	08	04	04
Total%	159100	13987.5	2012.5
Total Surgery	-		
Dialysis (Day Care)	21		
Chemotherapy	-		

Table VIII: Utilization Parameters of Hospital Facilities

Parameter*	Number
Total OPD visits	2434 Per day
Total hospital admissions	29 Per day
Total discharges including transfer, death & DORB	28 Per day
Total number of bed days	9,245
Average Length of stay (ALS)	3.6 days

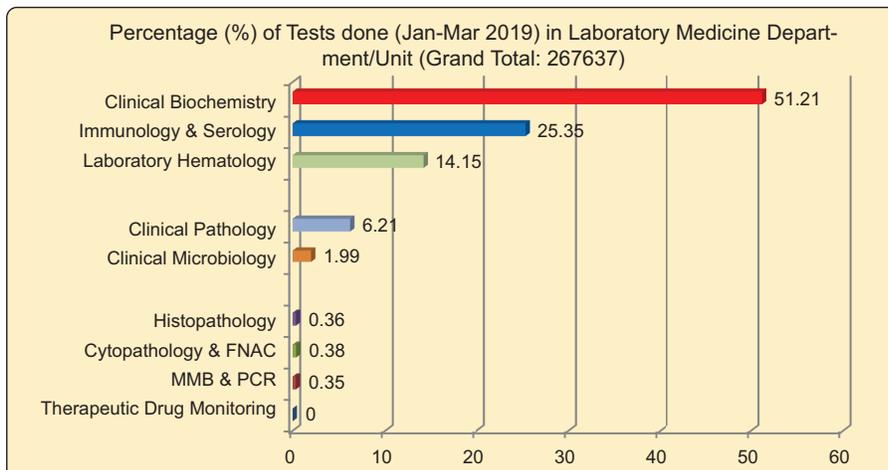*OPD: Outpatient Department; DORB: Discharge on risk bond.

Figure 3: Laboratory Medicine Investigations Done During the Study Period
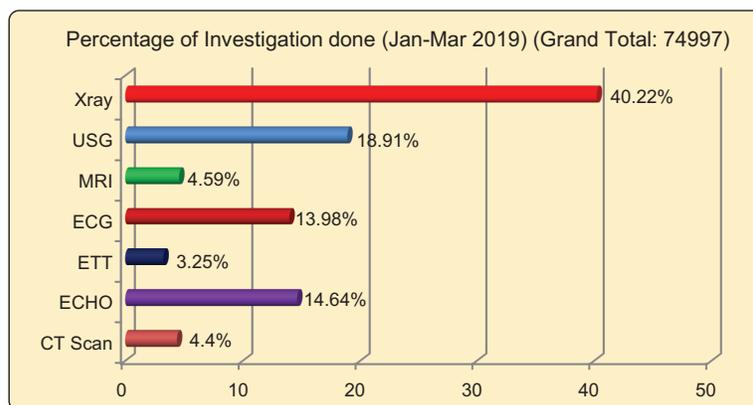
Figure 4: Radiology-Imaging Related Investigations Done During Study Period

Table IX: Incidence of Selective IQIs During the Data Collection Period

Inpatient Quality Indicators (IQIs): Selective	Cases Done (Total)	Surgical Case (Total)	Rate of Cases		Death (Total)	Mortality Rate	
			%	Per 10^3		%	Per 10^3
IQI 12 - Coronary artery bypass graft (CABG) mortality rate	191	2161	8.8	88	4 Out of 191	2.1	21
IQI 15 – Acute myocardial infarction (AMI) mortality rate	140	1970	7.1	71	12 Out of 140	8.5	85
IQI 26 – Coronary artery bypass graft (CABG) rate	191	2161	8.8	88	-	-	-
IQI 21 - Cesarean delivery rate, uncomplicated	117	1970	5.9	59	Nil	Nil	Nil
IQI 33 – Primary/ Normal cesarean delivery rate, uncomplicated	7	7 out of 124 deliveries	5.6	56	Nil	Nil	Nil

Table X: Incidence of Selective PSIs During the Study Period: January to March 2019

Patient Safety Indicators (PSIs): Selective	Cases Done (Total) (January- March 2019)				Deaths (January- March 2019)				Mortality Rate		Cases Done	
	Jan	Feb	Mar	Total	Jan	Feb	Mar	Total	%	Per 10^3	%	Per day (Ave)
PSI 06: Iatrogenic Pneumothorax rate											-	-
Not Found; Not documented according to AHRQ, USA												
PSI 13 -Postoperative sepsis rate											-	-
Not Traced; Not documented according to AHRQ, USA												
PSI 17 - Birth trauma-injury to neonate rate											Nil	Nil
No incidence; Not documented according to AHRQ, USA												
PSI 18 - Obstetric trauma-vaginal delivery with instrument rate											Nil	Nil
No incidence; Not documented according to AHRQ, USA												
PSI 19 - Obstetric trauma-vaginal delivery without instrument rate											Nil	Nil
No delivery was done without instrument												

Discussion

According to Avedis Donabedian, structures combine with processes to produce quality outcomes.[3,4,5,40] A number of studies have established the importance of organizational factors and processes of care while evaluating performance and quality of care in hospitals.[13,14] The applications of IQIs and PSIs identified by AHRQ, USA are made by measuring them using hospital administrative data/discharge sheet.[11,12] Ultimately healthcare compliance is about providing safe, efficient and effective high quality patient care.[24,25]

In the present descriptive cross-sectional study, some structural features and processes of care of the selected hospital were investigated. It has standard number of beds (Table 1) and an established organogram headed by Managing Director with supporting senior executives. It does have adequate administrative set up, its own purpose built building with parking space for about 100 cars and 4 ambulances.

The hospital has standard number of beds, processes and procedures for admission and discharge of inpatients, almost all clinical specialties and diagnostic departments with all investigation facilities as stated in Figures 1 and 2 and Tables-I, II and III respectively. The total staff situations in various areas of services i.e. Clinical Departments are shown in Table I, Radiology & Imaging related departments in Table II and Laboratory Medicine related departments in Table III. These were considered as high class and reasonably adequate facilities available at the hospital for providing quality patient care in almost all clinical departments.

Internal Medicine Department had the highest number of quality staff (n=75, 47.1%) followed by Surgery (n=46, 28.9%), Gynecology & Obstetrics (n=23, 14.5%0, NICU (n=08, 5.1%) and Dialysis+ Urology+ Oncology (n=07, 4.4%) (Table I).

Among the Radiology-Imaging related departments, Radiology-Imaging had the largest number of staff (47.36%), followed by USG (36.85%) and others (Table II).

The Table shows staff situation in Radiology-Imaging and related departments with highest in Radiology-Imaging (47.36%) followed by USG (36.85%) and others.

In the Laboratory Medicine and related departments, Clinical Biochemistry and Immunology (Automation) had the highest number of staff (29.5%), followed by Clinical Pathology (19.4%), and others (Table III).

The above Table shows that laboratory medicine and related departments have large number of technologists (36.0%) followed by computer composers (19.2%) for efficient management of laboratory reports delivery.

A large number of Nursing staff (n=275) had been employed with highest number of senior/staff nurses (53.54%) followed by trainee nurses (35.27%) and others.

Socio demographic information of junior doctors stated in table IV and those of junior nurses in table V indicated that high percentage of doctors were males (75%), while all nursing staff were females (100%); High percentage of doctors (62.5%) were unmarried, while 75% nursing staff were married. Age, religion and family size were comparable among the doctors and nurses. Job related information of doctors (Table IV) and nurses (Table V) revealed that only 25% doctors had >10 years, whereas 62.5% of nurses had experience of >10 years at the hospital. Responding to liking of job/nature of work, only 37.5% doctors, but 87.5% nurses responded saying 'Yes'; On the contrary, 62.5% doctors (Table VII) and only 12.5% nurses responded saying 'Yes, with reservation (Table IX). These were considered important professionally as indicative of some dissatisfaction among higher proportion of doctors, which may be identified and resolved by the authority of the hospital. In this regard, it should be remembered that human resource management (HRM) is an important management science and part of TQM. Therefore, better HRM practices in large hospitals should be encouraged which helps to develop staff satisfaction leading to quality healthcare.[9,10,41,42,43]

Information regarding the level of knowledge of senior clinicians, nurses and executives about quality healthcare/hospital service indicators, i.e. IQIs and PSIs, are presented in table VI. The information obtained indicated that a large proportion of professionals (respondents) did have significant level of knowledge about IQIs and PSIs and related factors. This was taken as important and significant positive point for the hospital towards quality healthcare services.

Investigations on some utilization parameters of the hospital (LSH) facilities were made as documented in table VII and table VIII. Of the total 159 beds, daily average occupancy was 139 beds (87.5%) with vacant 20 beds (12.5%) only. A large number of OPD visits (2434 per day), hospital admissions (29 per day), successful outcome/discharge (27 per day), total bed days: 9245 and ALS (3.6 days) were recorded. The total hospital aquired infections (HAI) and hospital deaths were only 1.76% (17.6 per 1000 cases) and about 1 per day respectively over the study period of January to March 2019. A large number of diagnostic laboratory investigations were done with a total of 267637 tests including all units of laboratory medicine. Among them, Clinical Biochemistry conducted highest number of tests

(n=137068; 51.21%) followed by Immunology & Serology (n=67828; 25.35%) and others (Figure 3). Total investigations done in Radiology-Imaging and related departments were 74997 over the study period. Among them, X-rays were the highest (n=30161; 40.22%) followed by USG (n=14185; 18.91%) and others (Figure 4).

Out of the total 191 CABG cases done during the study period of January to March 2019, deaths were 04, i.e. 2.1% (21/1000 cases) only. Similarly, 140 AMI cases were treated successfully with 12 casualties i.e. 8.5% (85/1000 cases) only. Of the 117 cesarean deliveries, no casualties occurred and primary/normal deliveries done were 07 cases only with no casualties, i.e. 100% successful achievements. These results suggested that the selected hospital was concerned about quality patient care (table IX). However, as indicated in table X, some difficulties were faced in MRD in tracing PSIs in the discharge files. That means there is a need for promoting patient safety culture as a strategy for improving the patients safety. This strategy should include all stake holders like policy makers, health care providers and those responsible for medical education.[44]

The findings narrated above and activities conducted were indicative that administration and senior staff of the selected hospital had high level of knowledge about quality and safety related health/hospital care indicators i.e. IQIs and PSIs relevant to AHRQ, USA. In fact, it has a QAD ensuring that services/activities are carried out efficiently and effectively. However, the hospital is yet to achieve strict compliance of IQIs and PSIs at international level. Hospital is an important but complex multi-disciplinary life-saving institution and related to making the community and the nation physically and mentally healthy. Better health leads to better productivity in all fronts of life in the society and the country as a whole. Despite recent developments in the Bangladesh healthcare sector, there is still great concern about the quality of it. Although there were some studies done comparing services of public, private and foreign hospitals from the perspective of Bangladeshi patients, IQIs and PSIs were not include in those studies.[45,46] Therefore, further studies are required comparing quality healthcare in terms of IQIs and PSIs among corporate hospitals in Bangladesh.

In conclusion, the observed mortality/casualty rates for CABG and AMI at the hospital are comparably low. Interestingly, no casualties were noted for cesarean and primary/normal deliveries. All these findings were considered as indications that the hospital do care and is concerned about quality healthcare/patient services. Overall, the selected hospital can be considered as one of the highest ranking hospitals in terms of quality healthcare (patient) services in the country. However, it can further improve its quality of healthcare/patient services to a level comparable internationally, if IQIs and PSIs developed by AHRQ, USA are strictly implemented and followed up regularly. Comparative studies including other private corporate hospitals with larger number of respondents are warranted to establish and extend our findings in the present study at the selected hospital in Dhaka City, Bangladesh.

Acknowledgements

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