



ORIGINAL RESEARCH

Quality of Laundry and Linen Service in Public and Private Hospitals

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Abstract:

Along with medical, nursing and other allied care services, laundry and linen services are very significant for achieving healthcare and patient satisfaction in tertiary level public and private hospitals. In the hospital, used linen harbor large number of potentially pathogenic microorganisms which may cause many infections. This lead to lengthen patient's hospital stay and aggravate cost of treatment which may result patient dissatisfaction. In Bangladesh, there is no linen related policy, therefore, this study tried to assess the quality of laundry and linen services in both public and private hospitals in Bangladesh.

Materials and methods:

This cross-sectional study was conducted among purposively selected 251 service providers (151 from public hospital and 100 from private hospital) and 117 service receivers (60 from public hospital and 57 from private hospital) from one public hospital namely Sher-E-Bangla Medical College Hospital (SBMCH), and from one private hospital namely Rahat Anower Hospital in Barishal district, Bangladesh from January to December 2019. In addition, 64 (34 from public hospital and 30 from private hospital) swab samples were selected purposively for microbiological test. Data was collected through two questionnaires and a checklist. Data processing and analysis were done using SPSS (Statistical Package for Social Science) version 23.

Results:

It was found that laundry department was not in the ground floor in private hospital like public hospital. On the other hand, color coded bag was used for collection of infected and non-infected clothes only in private hospital. Both public and private hospitals did not use separate compartment of the trolley for carrying the dirty linen. Maximum 73.68% of service receivers from private hospital were satisfied compared to public hospital (38.3%) regarding cleanliness of linen. Furthermore, the majority of service providers in both government and non-government hospitals had no history of influenza vaccination, and the majority of them were not trained in linen services. Public hospital's swab sample show the higher microbiological growth 19 (56%) than private hospital's sample 10 (33%).

Conclusion:

Due to the poor quality of linen services, both public and private hospital service providers and recipients are at risk of being infected by many diseases spread by linen.

Keywords: Laundry and linen services, quality, patient satisfaction, hospital

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Introduction:

Both public and private hospitals are provided with various essential and supportive services, such as medical, nursing and allied care as well as good hygienic food, clean linen, safe and favorable environment, and so on to ensure healthcare and patient satisfaction. The support services for patient care are indispensable for a hospital to perform in true perspective and facilitate the patient care process. Linen and laundry is a recognized support service in healthcare settings. In hospitals, this term is used to refer to the clothing of patients, medical and para-medical personnel. In addition, the fabrics which are used in the operation theatres, beds, and trolleys as the mattresses, pillows, blankets, sheets and towels etc in the name of patients care services are also included in the linen and laundry.

A prior author reported that the used linen, within healthcare settings, in particular, can harbor large number of potentially pathogenic microorganisms as it is soiled from various body fluids i.e. blood, urine, feces, saliva, sputum (1). Moravvej et al. (2013) found a significant amount of *Staphylococcus Aurous* in the white coats of healthcare providers (2). Pathogens were also discovered on other medical personnel's uniforms (3) and on bed linen in patients' rooms (4). Textiles may thus be responsible for pathogenic microorganism transmission to patients, as some studies have reported microorganism transmission from uniforms to patients and bed linen (5), or from dirty bed linen to staff uniforms (6). In the USA, the Centers for Disease Control and Prevention (CDC) estimates that Hospital Acquired Infections (HAI) account for an estimated 1.7 million infections and 99,000 associated deaths each year (7). A considerable amounts of patients were found to be developed HAI in a hospital based study in Bangladesh (8). HAI does not only occur among patients; healthcare providers are also in risk to have HAI as a study of ICDDR-B reported that a significant amount of healthcare workers had developed respiratory illness during working at surveillance ward (9). Therefore, cleanliness of hospital linen is very important issue because of occurring Hospital Acquired Infection (HAI). Due to nosocomial infection, lengthened patient's hospital stay and aggravated cost of treatment. Also it may increase both morbidity and mortality. As a result, the patient's satisfaction is likely to decrease. In addition, the reputation and patient's intake of

the concerned hospital services' also reduces. These HAI put intense pressure on the health service and hospital revenue.

Nonetheless, no research has been done on the quality of the entire laundry and linen service, its process and patient satisfaction on this service, either individually or collectively, in tertiary public and private hospitals of Bangladesh so far. As well as there is no standard linen policy in Bangladesh. This study was designed to assess the quality of laundry and linen services in both public and private hospitals in Bangladesh so that the hospital administration could know about the lack of laundry and linen services in their health facilities and take necessary steps to ensure patient satisfaction with services improvement.

Materials and methods:

This descriptive cross-sectional study was conducted among service providers and receivers of one public hospital namely Sher-E-Bangla Medical College Hospital (SBMCH), and one private hospital namely Rahat Anower Hospital in Barishal district, Bangladesh. In addition, swab samples were collected for microbiological test from the both selected hospital. A standard formula was used for the selection of sample size for both the service providers, and service receivers and the hospital linen of microbiological test. According to this formula the total sample size for respondents (service providers and receivers) comes to 384. However, due to time and resource limitations, 251 service providers (151 from public hospital and 100 from private hospital) and 117 service receivers (60 from public hospital and 57 from private hospital) were selected purposively as respondents' sample. In the case of hospital linen for microbiological tests, the sample size of 73 swabs was found by using standard formula. But 64 (34 from public hospital and 30 from private hospital) swab samples were selected purposively for microbiological test as there was time restrictions. This study lasted for about one year from 1 January 2019 to 31 December 2019.

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Data were collected using two questionnaires by face to face interview and a checklist by physical presence of first investigator. Among the questionnaires, one was semi-structured questionnaire which was designed for obtaining information from the service receivers. Other was semi structured self-administered questionnaire which were prepared for getting information from service providers as focus group discussion (FGD). The checklist, however, was prepared for assessing the status of physical facility, linen processing system, storage and distribution system of linen, availability of personal protective equipment's and safety measures at hospitals. On the other hand, microbiological test of the hospital linen (bed linen, pillow cover, surgeon gown, OT linen, and blanket) was carried out by taking swab culture from washed linen of the public and private hospital. The samples were taken purposively in the different OT and few wards of the public hospital and from the laundry department and general OT of private hospital. Then submitted to the microbiology department for investigation.

The questionnaires and checklist were pretested in the other place than the study area. Pretest was

done at Shaheed Suhrawardy Medical College Hospital, Dhaka to check the accuracy and degree of reliability of the questionnaire. Necessary modifications were carried out and the final research instruments were executed for data collection. After collection of data, they were checked, verified, coded and edited. The data entry was started immediately after completion of data collection. Data processing and analysis were done using SPSS (Statistical Package for Social Science) version 23. Data were analyzed according to objectives of the study. Descriptive statistic was used for all variables. Values were expressed as frequencies and percentage.

Before preceding the data collection, the details of study were thoroughly explained to each of the eligible respondents and written consent was taken from the respondent. Questionnaire was translated into Bengali for respondents' better understanding and obtaining error free data. Prior to the commencement of this study, ethical approval of the research protocol from the Institutional Review Board (IRB) of National Institute of Preventive and Social Medicine (NIPSOM) was taken.

Results:

Physical facilities			
01.	Location of the Laundry Department	Public	Private
	Adjacent to the main Hospital building	Yes	Yes
	In a separate building	No	No
	Close proximity to CSSD	Yes	No
	Ground Floor	Yes	No
	Convenient access to lift	Yes	Yes
	Close to the dietary department	No	Yes
	Adjacent to laundry managers office	Yes	Yes
02.	Condition of water supply of laundry department		
	24 hours water supply	Yes	Yes
	Facility of both hot and cold water	Yes	Yes
03.	Condition of power supply of laundry department		
	24 hours' power supply	No	Yes
	Stand by generator in any case of emergency	No	Yes
04.	Condition of fire safety of the department		
	Availability of fire extinguisher	Yes	Yes
	Knowledge of basic fire safety issues among staffs	Yes	Yes
05.	Condition of the floor & ceiling		
	Dry	Yes	Yes
	Non slippery	Yes	No
Linen processing system			
06	Basis of cleaning, the hospital follows		
	Based on rent	No	No
	Contract based	Yes	No

	On a co-operative basis	No	No
	The hospital has its own washing plant with their own manpower	No	Yes
	The hospital has its own washing plant but an outside source of manpower	No	No
07	Segregating and collecting process of soiled linen		
	Segregation of infected and non-infected linen	Yes	Yes
	Using of any color coded bag for collection of infected and non-infected clothes	No	Yes
	Use yellow bag for soiled (stool-urine) linen	-	Yes
	Use red bag for infected linen	-	Yes
V.	Use green bag for dirty linen	-	Yes
08	Process of transporting of the soiled linen		
	Use separate trolley for collecting infected, non-infected soiled linen	Yes	Yes
	Use two separate compartment of the same trolley for infected & non-infected soiled linen	No	No
	Transport both the infected and non-infected soiled linen separated without using any separate compartment	No	No
09	Requirements for proper washing		
	Separate washing space for infected, non-infected soiled linen	No	No
	At first wash non infected linen and then infected linen in the same space	Yes	Yes
	No specific strategy maintain for washing	No	No
	Use of detergent for washing	Yes	Yes
	Use of Chlorine solution for Washing	Yes	Yes
	Use of Liquid Bleach(Sodium hypochlorite, a small amount of Sodium hydroxide) and soda for Washing	Yes	Yes
	Use of Softener for Blanket , Towel and OT soft linen Washing	No	Yes
	Use of Autoclave Machine for OT linen sterilization	Yes	Yes
10	Availability of machines		
I	Water extraction machine	Yes	Yes
II	Dryer	Yes	Yes
III	Ironing Machine	Yes	Yes
IV	Washing Machine	No	Yes
Storage and Distribution System of Clean Linen			
11	Process adopted by the hospital for the distribution of the clean linen		
	Exchange the trolley	No	No
	Topping up	No	No
	Requisitioning	Yes	Yes
	Daily quota system	No	No
12	Process of clean linen transport		
	Use completely separate and clean trolley for clean linen	Yes	Yes
	Use separate compartment of the trolley which was used to carry the dirty linen	No	No
	Use the same trolley which was used for carrying the soiled linen and no separate compartment for the clean linen	No	No
13	Condition of the storing place		
	Clean	Yes	Yes
	Dry	Yes	Yes
	Free from insects	No	No
14	Available sets of clean linen		
	In use -1set	Yes	Yes
	In laundry -1set	Yes	Yes
	For immediate use-1set	Yes	Yes
	For emergency use-1set	No	Yes
15	Any kind of record is kept	Yes	Yes

Table: 1 Distribution of physical facilities of linen service, linen processing, storage and distribution of linen system at the public and private hospital

Table 1 illustrates that about 73.33% physical facilities were available in both public and private hospital. The condition of physical facilities was observed under 5 sub-headings such as location of the laundry department, condition of water supply, power supply, fire safety and floor and ceiling of the department. The laundry department of both public and private hospital was not situated in the separate building. Further, the public hospital’s laundry department was situated close to dietary department. In addition, laundry department of government hospital did not have 24 hours’ power supply and stand by generator in any case of emergency. Interestingly, private hospital’s laundry department’s floor was not found non-slippery. On the other hand, 61.90%, 95.23% linen processing system was maintained in public and private hospital, respectively. Linen processing system was checked on the basis of 5 factors, namely basis of cleaning the hospital follows, segregating and collecting process of soiled linen, process of transporting of the soiled linen, requirements for proper washing, and availability of machines. It was seen that private hospital had

its own washing plant with their own manpower. In addition, all the 5 activities related with segregating and collecting process of soiled linen were carried out by the private hospital where public hospital follow only one activities such as “segregation of infected and non-infected linen”. Both hospital used separate trolley for collecting infected and non-infected soiled linen but didn’t use two separate compartment of the same trolley. Both hospitals were seen that they had some requirement for proper washing. Of these, chlorine solution, detergent, autoclave machine for OT linen sterilization were significant. In regards to the storing and distribution of linen system, 73.33% and 93.33% process were maintained in public and private hospital, respectively. It was observed that exchange the trolley, topping up and daily quota system was not followed at both hospitals where completely separate and clean trolley for clean linen was used in the both hospitals. Moreover, clean and dry storing place was used by both hospitals. Unfortunately, public hospital did not have clean linen sets for the purpose of emergency use.

Variables	Sub-groups	Hospitals		
		Public (n=60) f (%)	Private (n=57) f (%)	
Age of the respondents (in years)	≤30	21(35%)	19(33.3%)	
	31-40	15(25%)	7(12.3%)	
	41-50	18(30%)	13(22.8%)	
	>50	6(10%)	18(31.6%)	
	Mean ± SD = 37.23 ± 9.752			
	Gender	Male	31.70%	43.9%
Female		68.30%	56.1%	
Access to hospital dress after admission	Yes	0(0)	57(100%)	
	No	60(100%)	0(0%)	
Changing pattern of linen of the respondents	Daily	0(0%)	10(17.5%)	
	Every alternative day	1(1.7%)	3(5.3%)	
	Twice weekly	21(35%)	36(63.2%)	
	Only when dirty	38(63.3%)	8(14%)	
Getting linen as per the need of the respondents	Yes	20(33.3%)	48(84.2%)	
	No	40(66.7%)	9(15.8%)	
Opinion regarding cleanliness of linen	Satisfied	23(38.3%)	42(73.68%)	
	Dissatisfied	37(61.7%)	15(26.32%)	

Table 2: Distribution of service receivers (N=117) according to demographic status and their opinion regarding linen services

Table 2 shows that total 117 service receivers from both public (60) and private (57) hospital participated in this study as respondents. The maximum 35% and 33.3% % of respondents' age was ≤30 year ages for both public and private hospital, respectively. Both public and private hospital's service receivers' Mean ± SD was 37.23 ± 9.752 years. Female service users were higher than male in both public (68.30%) and private (56.1%) hospitals. It is observed that all respondents 60(100%) of public hospital did not get any hospital dress after admission whereas all respondents 57(100%) of private hospital got hospital dress from hospital after admission. The highest respondents 38(63.3%) of public hospital said that new linen was changed only when it

became dirty whereas maximum respondents 36(63.2%) of private hospital said that new linen was changed twice a week. Only 1(1.7%) respondent of public hospital and 3(5.3%) of private hospital said that new linen was changed every alternative day. In the case of getting linen as per requirement, maximum respondents 40(66.7%) of public hospital did not get linen according to their need whereas maximum respondents 48(84.2%) of private hospital got linen according to their need. In regards to the distribution of the respondent by their opinion regarding cleanliness of linen, the highest respondents 37(61.7%) of public hospital were dissatisfied whereas maximum respondents 42(73.68%) of private hospital were satisfied in this regard.

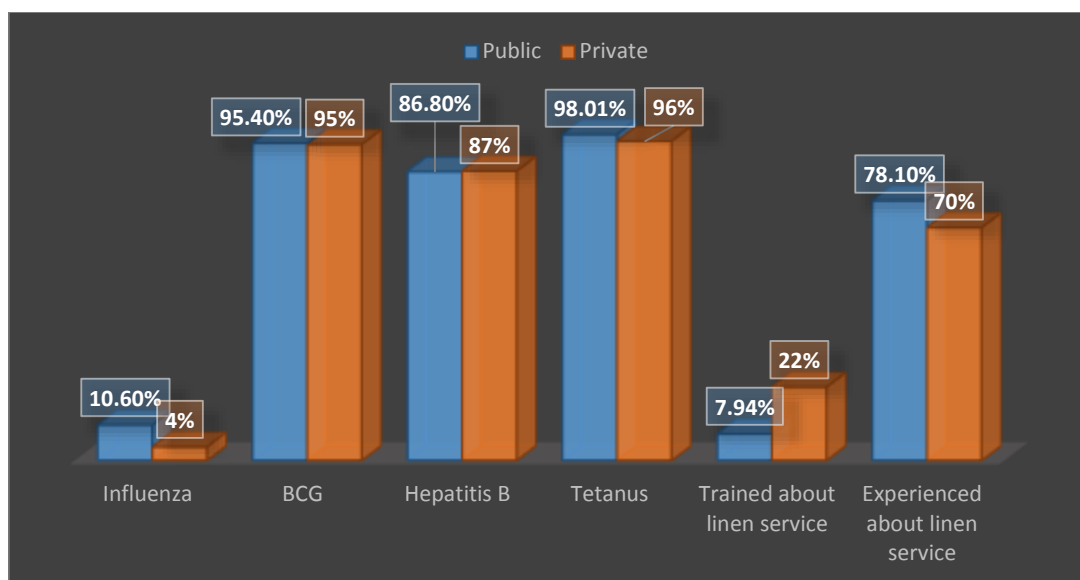


Figure 1: Percentage of service providers in public (n = 151) and private hospitals (n = 100) who have been vaccinated and who are trained and experienced in linen services.

Figure 1 illustrates the percentage of service providers for both public and private hospital who received vaccination against some certain diseases as well as who were trained and experienced about linen services. Vaccination against tetanus was received by the almost 98.01% and 96% of public and private hospital service provider, respectively. As opposed to, only 10.60% and 4% of service provider from public and private hospital had history of getting vaccination against influenza. In the case of BCG vaccine, approximately 95.40% and 95% of service provider from public and private hospital had received this vaccine. Further, 86.80% and 87% of service provider from public and private hospital had hepatitis B vaccine.

Personal protective equipment	Public	Private
Cap	Supplied	Supplied
Mask	Supplied	Supplied
Gloves	Supplied	Supplied
Gown	Supplied	Supplied
Plastic apron	Not supplied	Not supplied
Goggles	Not supplied	Not supplied
Gum boot	Not supplied	Supplied

Table 3: Availability of personal protective equipment (PPE)

The table 3 presents that approximately 57.14% and 71.42% of personal protective equipment's was available in public and private hospital, respectively. Cap, Mask, Gloves, Gown was

supplied by both hospitals where plastic apron and goggles was not supplied by any hospitals. Further, gum boot was not supplied by the only public hospital.

Samples	Public		Samples	Private	
	Frequency	Percentage		Frequency	Percentage
Bed sheet	7	20.5	Bed sheet	5	16.67
Pillow cover	5	14.7	Pillow cover	5	16.67
OT table cover	5	14.7	Patient's hospital dress	7	23.33
Surgeon gown	7	20.5	Surgeon gown	6	20
OT cap	5	14.7	Blanket	7	23.33
OT mask	5	14.7			
Total	34	100.0	Total	30	100.0

Table 4: Distribution of items (swab samples) of washed linen which were collected in the public hospital (n=34) and private hospital (n=30)

Table 4 pictures the number of swab samples of washed linen which were collected in the selected government and private hospital. It is seen that a total of 34 swab samples were collected from washed linen of public hospital. Majority of samples were bed sheet 7 (20.5%) and surgeon gown 7 (20.5%). In addition, 5(14.7%) samples were taken from operation theatre, table cover, pillow cover, OT cap, and OT mask separately. In contrast, about 30 swab samples were collected from washed linen of private hospital where majority of them samples were collected from patient's hospital dress 7(23.33%) and blanket 7(23.33%). Further, 5(16.67%) samples were taken from bed sheet and pillow cover, respectively and rest of the number of samples were collected from surgeon gown 6(20%).

Figure 2 presents the microbiological growth in washed linen samples collected from public and private hospitals. Public hospital's sample show the higher microbiological growth 19 (56%) than private hospital's sample 10 (33%). As opposed, there were more negative microbiological growth in private hospital's sample 20 (67%) compared to public hospital's sample 15 (44%).

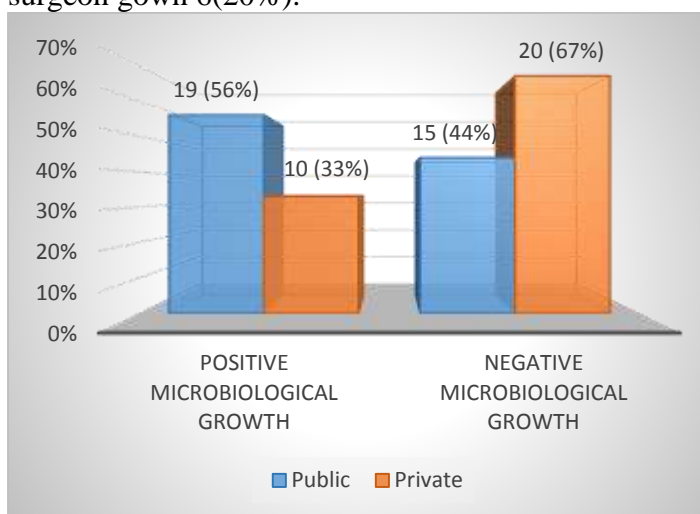


Figure 2: Distribution of microbiological growth in the samples collected from washed linen in public (n=34) & private hospitals (n=30).

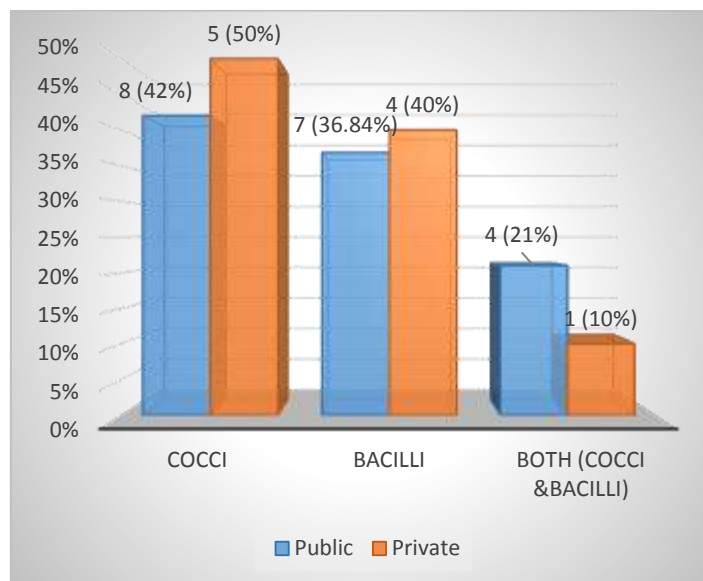


Figure 3: Distribution of the microorganisms found from culture sensitivity test of samples collected from washed linen in public (n=19) & private hospitals (n=10)

Figure 3 shows the presence of different microorganism in percentage in washed linen in both public and private hospital. Public and private hospital's sample contained about 8 (42%) and 5(50%) cocci group microorganism, respectively. On the other hand, 7 (36.84%) and 4(40%) of public and private hospital's sample possessed

bacilli group microorganism, successfully. Both cocci and bacilli microorganism was found in the

rest of 4(21%) and 1(10%) of sample in public and private hospitals, respectively.

Public				Private			
Name of Wards	Total sample number	Positive microbiological growth	Percentage	Name of Wards	Total sample number	Positive microbiological growth	Percentage
Orthopedic OT	5	3	60	Store of linen department	15	6	40
Gynae OT	5	4	80	General OT	15	4	26.66
General OT	5	1	20	--	---	----	---
E.N.T OT	4	1	25	--	---	----	---
Post-operative store room	5	2	40	--	---	----	---
Male surgery ward	5	4	80	--	---	----	---
Female orthopedic ward	5	4	80	--	---	----	---

Table 5: Distribution of the Positive microbiological growth of washed linen in different wards and operation theatres in the public hospital (n=34) and private hospital (n=30)

Table 5 presents the distribution of positive microbiological growth on washed linen in various wards and operating rooms in the public and private hospitals. Total 34 number of samples were collected from washed linen of different wards and operation theatres of public hospital. Among them, the highest 4 (80%) positive microbiological growth was found in the Gynae OT, male surgery ward and female orthopedic ward. In contrast, about 6 (40%) positive microbiological growth from the linen store of linen department and 4 (26.66%) positive microbiological growth from general operation theatre was found among 30 samples of private hospital.

Discussion:

This cross-sectional study was carried out to assess the status of selected public and private hospital’s linen services (physical & human resource facilities of linen service, linen processing, storage

and distribution system), service receivers’ opinion regarding hospital linen condition, availability of personal protective equipment’s and safety measures of service providers and the microbiological condition of linen.

The present study noticed that the laundry department was not in the ground floor and closer to the central sterile services department (CSSD) for private hospital. On the other hand, public hospital’s laundry department was not near to the dietary department. This means that the selected both public and private hospital’s linen and laundry services was not situated according to the guideline of McGibnoy (10). Singh and his colleague (2009) stated that location of linen and laundry services at hospital ground provides easy access to emergency department, operation theatre and wards etc (11). In addition, linen and laundry services’ location proximal to the dietary department and central sterile services department (CSSD) gives opportunity for supplying steam from the boiler

house (11). In regards to the condition of power supply of laundry department, the selected public hospital had not generator system which may create chaos in laundering the linen, so as to delaying of delivering the linen. Moreover, this study found that laundry department's floor in private hospital was slippery which may cause several types of injuries such as bruise, head injuries, damage to ligaments or tendons, fractured or dislocated bones, etc.

The current survey shows that both public and private hospitals run their cleaning services without any basis for cleanliness. Though both government and non-government hospital segregated infected and non-infected linen, no color coded bag was seen using for the collection of infected and non-infected clothes in the public hospital. In addition, they did not use separate washing space for infected, and non-infected soiled linen. A recent study suggests that contaminated environmental surfaces may play an important role in transmission of healthcare-associated pathogens (12). On the other hand, a prior research found not-using color coded bag for carrying the infected cloth as the source of nosocomial infection (13). Sakharkar (2009) recommended washing machines as a major tool for the hospital's laundry department, but this study did not detect the presence of washing machines in government hospitals (14).

According to Sehulster, the transport and storage of clean linen "is the part of the overall process that is most vulnerable to outside contamination" and pathogens can survive on environmental surfaces for hours to months, including Health Care Textiles (HCTs) (15). The present study shows that both government and private hospital did not exchange the trolley, did not topping up and did not use daily quota system in the case of linen distribution. U.S. Department of Health and Human Services, and Centers for Disease Control and Prevention (CDC) recommended to transport the clean or soiled laundry to and from hospitals separately. Even if the vehicles is same, there should be some type of physical separation in it, they also suggested this (16). The findings of this study is inconsistent with the above-mentioned recommendations. On the other hand, it was noticed that the storage place of both public and private hospital was not free from insects which is very alarming in order to maintain the hygiene quality of storage place.

The goal of linen and laundry is to provide regular and timely supply of clean linen to the satisfaction of patients and staff (17). This implies that patients or service receivers' satisfaction can be achieved by linen and laundry service. The current study results illustrate that about 61.7% service receivers from public hospital was dissatisfied about cleanliness of linen where 73.68% service receivers from private hospital was satisfied in this regard. Since the linen of government hospitals is changed only if it is dirty which was reported by 63.3% of the service recipients, that may be the main possible cause of dissatisfaction among them. Also, in the ongoing study, the recipients of public hospital services were getting less linen as per their requirement as compared to private hospitals. Even those who receive government hospital services do not receive linen as soon as they are admitted to the hospital, which has been proven in this study with 100 percent of the respondents. However, in private hospitals, the complete opposite picture was observed.

Healthcare-associated infection is a major public health concern around the world, owing to increased mortality, costs, and length of stay in healthcare settings (18). It is estimated that 1 in every 10 patients is affected by healthcare-associated infection worldwide (18). Health care workers are also in risk to develop many types of healthcare-associated infection as a hospital based surveillance in Bangladesh reported the occurrence of respiratory illness among healthcare workers (9). The running study observes that almost all the study subjects (service providers) in both public and private hospital had a history of vaccination against BCG, Tetanus, Hepatitis B but very less had a history of vaccination against influenza. Therefore, it is requested to the concerned authority to take necessary steps managing influenza vaccine for healthcare workers which is also strongly suggested by the CDC (19). In addition, hospital authorities are advised to arrange training on linen services for their healthcare workers as few healthcare staff in both public and private hospital were trained in this regard according to this study finding. Along with this, authorities should focus on providing personal protective equipment towards their healthcare staff for minimizing cross-contamination of diseases as this study found the plastic apron, and goggles are not provided by the both public and private hospital authority to their healthcare staff.

Presence of microorganisms in the hospitals textile is not uncommon for this study. Like this study, an earlier study found positive microbial growth in hospital clothing (11). On the other hand, a hospital based study showed the presence of both positive and negative microorganisms in its hospital linen (20). Among these microorganisms, the Staphylococcus and Bacillus were predominant. This is consistent with the present study findings as cocci and bacilli group microorganism were noticed from culture sensitivity test of samples collected from washed linen of the selected hospitals. The analysis of this study shows that the wash linen contained microorganisms in Orthopedic OT, Gynecology OT, General OT, ENT OT, post-operative store room, male surgery ward and female orthopedic ward. However, the reason behind this has not been investigated. Therefore, according to the department wise pathogens' frequency, the difference in the growth of microorganisms should be tested so that preventive measures can be taken to reduce its growth.

Conclusion:

Laundry and linen service plays a very important role among all the services of hospital. The quality of this service can gain patient satisfaction and can minimize the spread of hospital acquired disease transmission simultaneously. The quality of this services depend on many factors. Public hospital had no separate laundry department with own washing plant like private hospital. In private hospital, all service receiver got the hospital dress after admission but there was no hospital dress provided for the service receiver of public hospital. In addition, both hospital did not use trolley which has separate compartment for the clean linen transportation. Further, most of the service providers of both government and non-government hospital had history of no vaccination against influenza as well as maximum of them were not trained about linen services despite there were evidence of microbial growth of washed linen at both selected hospitals' different department. This is very alarming for both service provider and receiver to become infected.

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