

Study on Financial Feasibility of Laundry Department in Maharani Laxmi Bai Medical College, Jhansi

By

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*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Dr. Anudeep Agarwal** student of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone dissertation training at **Maharani Laxmi Bai Medical College, Jhansi** from 4th February, 2016 to 30th April, 2016.

The Candidate has successfully carried out the study designated to him during dissertation training and his approach to the study has been sincere, scientific and analytical. This training is in fulfillment of the course requirements.

I wish him all success in all future endeavors.



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18-05-18

CERTIFICATE

This is to Certify that Dr. Anudeep Agarwal, a student of IIHMR University, Jaipur has carried out a project on 'Financial feasibility of Laundry Department in Maharani Laxmi Bai Medical college, Jhansi.' This project work has been prepared by the student himself with utmost sincerity and this work has not been presented earlier for any academic activity.

I wish him all the very best & success in his further future endeavours.

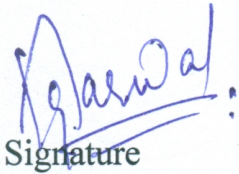
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THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **“A study on the financial feasibility of a laundry department in MahaRani Laxmi Bai Medical College, Jhansi** and submitted by **Dr Anudeep Agarwal** Enrollment No. **IIHMR-U/MBA-HM/2014-2016/19-1533** under the supervision of **Dr.Suresh Joshi** for award of Postgraduate Diploma in Hospital and Health of the University carried out during the period from **2014 to 2016** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.



Signature

ACKNOWLEDGEMENT

“A Great achievement solution dawns with an idea, grows with our effort and attains fulfilment with our will power”. In our effort towards the realization of my project work, I have drawn on the guidance of many people for which I’m glad to acknowledge.

I acknowledge the contribution of my mentor **Dr. Suresh Joshi** (Dean, Training-IIHMR) whose detailed suggestions have vastly enhanced the quality of my work.

I got the opportunity to pursue my summer internship from Maharani Laxmi Bai Medical College, Jhansi. It was an opportunity to work with one of the best health care service providers.

I would like to thank my mentor & guide **Dr. Prof. N.S.Sengar** for providing an opportunity to carry out the project work and utilizing the facilities available. Without her valuable guidance and consistent support, this project would not have got underway.

I’m also thankful to all those who have directly or indirectly encouraged me to complete this project.

THANK YOU ALL

About the Organization:

This Medical college is named after the “Jhansi ki Rani” Maha Rani Laxmi Bai. This medical college came into existence in 1968 to provide medical care to poor people of this region, Bundelkhand.

The first batch of 50 MBBS Student was admitted for Jhansi. L.L.R.M. Medical College, Meerut in 1968 as the construction of college building was still in progress. In 1970 Professor S.K.Saxena, took over as the Head of the department of anatomy at the college, to co-ordinate the activities of this institution, that the regular admissions of students admitted in past two years Meerut for Jhansi were transferred to this place. On September 1st, 1971 Professor S.R.Kapoor took over as the first Principal at the college.

The college building spread over a walled area of 380 acres, and this is perhaps the biggest medical college campus in the country. The building grouped into 3 blocks namely administration & teaching block, hospital block, residential block. Near the hospital block & close to old private wards, there are newly formed 24 new private wards. Behind the training center of health and family welfare building, there is an oncology wing. In the hospital block there is also a newly formed Burn unit. The hospital of medical college provides comprehensive medical care, services to the people of Bundelkhand division of Uttar Pradesh the four adjoining districts of Madhya Pradesh.

The hospital provides the teaching and training facilities to undergraduate and post graduate students.

The college admits 50 students each year in MBBS course and nearly 54 post graduate student in various specialties. College is actively involved in various national health Programmes, e.g. Maternal and Child health, Integrated Child Development Scheme, Family Welfare, Pulse Polio Immunization programme etc.

LOCATION

The hospital is located on Kanpur road about a kilometer beyond Bundelkhand University. Patient should enter through gate no.1 of the medical college.

No. of Beds, Doctors & Nurses Etc.

The hospital has a total bed strength of 700 beds. There are about 45 consultants, 200 junior doctors including interns and 106 nurses.

Emergency Services

Casualty is located between hospital building and administrative building..

The services are available round the clock through out the year. Anyone with urgent medical problem can seek consultation / treatment in casualty after buying a ticket.

The causality has dedicated team of junior & senior doctors, nurses and other paramedical staff.

The treating doctor will call any specialist/super specialist on call as and when required.

Causality has been equipped with all modern gadgets like ventilators, monitors, central oxygen supply etc. and has fully equipped **emergency operation theatre** for urgent services.

OPD Services

All OPDs are located on the ground floor of the first wing of the hospital building. Consultation hours are from 8:00 AM to 2:00 PM.

One should buy the OPD ticket from the main counter for Rs.1(one rupee only) and then should get registered at the respective OPDs.

Patients are seen on first come first served basis.

Investigation Services

After OPD consultation, the treating doctor will advise the patient for various investigation if needed and will guide him/her to be concerned lab/department.

Samples for common pathological tests are collected in OPD lab situated on first floor near the blood bank. Patients may collect their reports next day. However, for certain special investigation, patients are directed to contact the department concerned in the college/hospital building. All services are charged as per the prevailing norms fixed by the Government. Many other facilities like plaster, injections and immunization, ECG, EEG, TMT, minor surgical procedures and physiotherapy etc are also provided in OPD.

Indoor Services

The decision to admit a patient rests with the treating doctor. Patient admitted in general wards of the hospital will have to deposit file charges of Rs.34(rupees thirty four only). This entitles them for doctors consultation, linen, medicines diet etc.

However for very poor patients, the file charges may be waived off by CMS/Principal on production of BPL Card.

Detail of the MCs infrastructure

(a) Academic Facilities available

Lecture Theatres 3

Dem. Rooms,

Common Rooms,

Laboratories.

Central Library including Departmental libraries Skill Laboratories Computer

Lab. 1

Auditorium

- (b) Hospital Available
- (c) Residential Facilities: Principal Residence 1 C.M.S. Residence 1
Matron Residence 1
Dy. Supdt. Residence 1
Asstt. Matron Residence 1
PR residence 20
Type IV Residence 29
Type III Residence 18
Type II Residence 34
Type I Residence 74
- (d) Recreation Facilities Indoor & Out Door
- (e) Medical Facilities for Students & Staffprivate.

DEPARTMENT DETAILS

Name of Teacher	Designation	Contact No.
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Dr. Kaishav Kumar (C)	Professor.	
Dr.Arun Kumar Sharma	Lecturer.	
Sri Raghubir Singh Mandoloi	Lecturer	
Sri Anuj Kumar	Lecturer	
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Dr.R.P.Srivastava (C)	Associate Professor	
Dr.Vinay Kumar (C)	Lecturer	

A Study on “Financial Feasibility of a Laundry Department in Maharani Laxmi Bai Medical College, Jhansi” :

Introduction:

Clean linen supply and laundry services are some of the vital elements for hospitals in providing high quality medical care to patients. Efficient supply and management of linen without any defect and delay becomes good support for hospitals to deliver satisfactory healthcare services to the patients ⁽¹⁾. It plays a major role in reducing infection rate, increase patient satisfaction and reduce operation cost of hospitals.

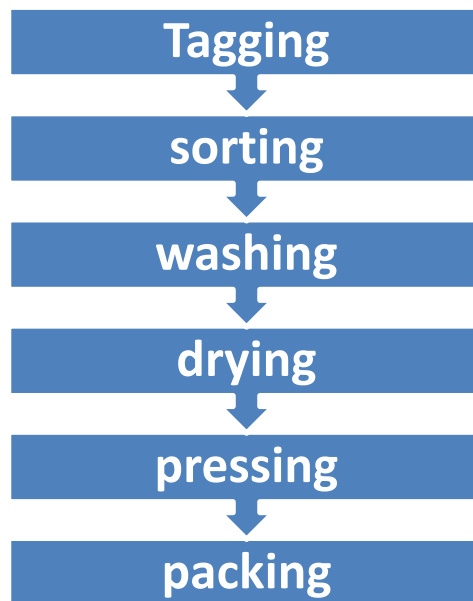
Traditionally, laundry has been done by a particular service class, *Dhobis* that has proved to be poor, unhygienic, erratic and falsely economical. Mechanised laundry is the best service method of linen supply to hospitals. There are no two opinions regarding the desirability to establish mechanical laundries in hospitals. Despite of its importance in improving quality services, hospital linen and laundry services has not been given the priority it deserves.

India is the emerging market and holds immense growth opportunities for hospital linen supply and laundry services because of increase in number of medical facilities coupled with development of healthcare infrastructure⁽¹⁾. Moreover, the growing demand of quality services and patient expectations are bringing the right conditions for hospital laundry to turn into a more profitable, better quality industry.

Production Process Flow:

Liquid solvent and small amount of water are added to the machine. The machine then stirs clothes in a manner similar to a domestic washing machine to remove dirt, oil, and stains. Once clean, the clothes are then manually transferred to a dryer (laundry procedure), then pressed and shaped.

Process Flow Diagram



Tagging: The clothes are firstly tagged with a specific number. This procedure is used for identification of clothes for particular wards

Sorting: After tagging the clothes are arranged in different sets. Some people sort by colour, others sort by fabric type.

Washing: The clothes are washed in a washing machine using detergents, washing powders, soaps and etc. This procedure is only applied for laundry services.

Drying: The clothes washed in a laundry procedure are dried using dryers.

Steam Pressing/pressing: In this process, both the clothes either washed or dry-cleaned are pressed and shaped using steam press equipment.

Packing: Once pressed, the clothes are properly hanged and covered in the plastic wrap and then tagged so that they can be easily identified

Literature Review:

The laundry service industry in India is highly fragmented and unorganised, organised laundry services being just 5% ⁽²⁾.

According to Modern Healthcare magazine, laundry services are now the third most outsourced service in healthcare facilities. Hospitals that outsource their laundry services are seeing improved linen utilization rates ⁽⁵⁾.

A study by American National Standards Institute (ANSI) and the Association for the Advancement of Medical Instrumentation (AAMI) showed that when laundered properly, reusable garments and drapes are 70 per cent more effective in providing barrier protection ⁽⁴⁾.

An On-premise laundry (OPL) is viable for a 500 bedded hospital while smaller hospitals lesser than 500 beds should outsource their laundry services ⁽³⁾.

On an average 2.5-3 kg linen/bed/day is generated in an Indian hospital ⁽⁶⁾.

Size of laundry area depends on the size of hospital and linen requirement. According to survey of Delhi hospitals conducted in 1978, land requirement for hospital laundry is 10 sqft/bed or 10sqft/2.5kg of linen ⁽³⁾.

Research Question

- ❖ What is the financial viability of a laundry department in Maharani Laxmi Bai Medical College, Jhansi?

Objectives:

- ❖ To determine the cost incurred in setting up the laundry unit in Maharani Laxmi Bai Medical College, Jhansi
- ❖ To determine expenditure incurred in washing linen per bed per day to understand and assess the financial viability of a laundry department in Maharani Laxmi Bai Medical College, Jhansi

Research Methodology:

There are two sets of data were generated during the course of study:

- ❖ 1st set of data would be based on review of hospital documents and personal discussion with concerned officers of laundry department. This set of data would give an understanding of the fixed cost and operational cost of running the laundry department
- ❖ 2nd set of data will be based on collection of all the linens received by the laundry department from 15 wards of the hospital every day from Monday to Friday (to account for daily variation) for a period of 2 weeks (from 1st march to 14th march) during the working hours of laundry department.

Subsequently, the linens would be segregated into different items and listed. On day one, all the items of a particular category will be weighed using median way of mathematical calculation. This will give me a standard weight of an item. Subsequently, the total weight will be calculated by multiplying total number of items by its respective weight for a particular category. The data would be recorded on a pre-designed excel spread sheet.

- ❖ On discussion with Laundry managers of various Hospital Laundries in Jaipur, estimation on average cost incurred in washing one kg of linen was obtained along with other suggestions and recommendations.

Data Assessment Tool:

Fixed cost of assets and monthly operational cost will be calculated as follows:

Project cost/ Fixed cost:		Monthly Operational cost/Variable Cost:	
1	Machinery and equipment	1.	Human resource
2.	Interest on bank loan of assets (if any)	2.	Machinery maintenance
3.	Vehicles	3.	Direct electricity
4.	Furniture and fixture	4.	Direct water
5.	Pre-operating cost	5.	Direct gas
6.	Security deposit (if any)	6.	Chemicals used
		7.	Transportation cost (driver + fuel + vehicle maintenance)
		8.	Communication expense (telephone + internet)
		9.	Stationary

- ❖ Please note that land cost is not included in fixed cost/ Project cost as it is a government setup and laundry department is within the Hospital building.

Linen used in different wards will be categorised into different types (pillow, bed sheets, patient dress, blankets etc) and will be weighed per unit. Linen generated for washing will be counted daily from Monday to Friday (to account for daily variation) for a period of 2 weeks during the working hours of laundry department.

Weight / Unit Wise Distribution of Product Mix per Month :			
Type of Linen :	Weight of linen type (Median) (kg) :	Number of linen type, per month :	Weight per Month:
Bed-sheet			
Pillow cover			
Blanket			
Towel			
Patient dress			
Duster			
Diet cloth			
Mortuary sheet			
Baby sheet			
More, if any used in ward:			

- ❖ Please note, Wards which use laundry for washing their linen will be taken under study.

Total cost incurred for washing linen for a period of 8 weeks will be calculated (Table 1) and Simultaneously, Total weight of linen washed in laundry department during the same period (Table 2) will be measured and **hence, cost of washing linen per kg per bed will be obtained.**

- ❖ Please note, data collection of Linen generation was done for a period of 2weeks and financial calculations were done for a period of 4 weeks, which will then be generalised for one month. Any periodic variation due to any reason during the course of study will be mentioned in the final report.

Laundry Units in Maharani Laxmi Bai Medical College, Jhansi :

There are two Laundry units in Maharani Laxmi Bai Medical College, Jhansi. One is located in east wing (operational capacity-600kgs/day) and the other one (operational capacity-300kgs) is located in west wing. Laundry in the East wing was established in year 2010 and the one in the west wing was established in 2000.

- Laundry A (West wing): This laundry was studied in detail and financial viability was calculated for this Laundry. All the calculations and data are collected for this Laundry only during the course of study.
- Laundry B (East wing): This laundry was visited twice during the course of study to understand the operational capacity and its utilization. It was observed that linen from 8 wards is washed in this Laundry. The machines in the Laundry has higher maintenance cost and runs at 70% of its operational capacity.

Installed and Operational Capacity:

The Laundry department of Maharani Laxmi Bai Medical College, Jhansi, has an installed capacity of processing around 500 kg's (60-70 kg per bath per washing machine) of Linen per day. Maximum utilization of the unit is assumed to be 90%, however it runs below 50% of its installed capacity.

Installed and operational capacities:	
Description	Details
Working hours per day	7
Operating shift per day	1
Working days per month	24-26 days (6days in a week)
Maximum weight of Linen washed per day	600
Maximum weight of Linen per Batch per washing machine	60-70
Hours utilised per batch (Laundry and drying)	3

Project Cost Summary:

A detailed financial model has been developed to analyse the financial viability of laundry department in Maharani Laxmi Bai Medical College, Jhansi

1. Project Cost:

Following fixed capital have been identified for operations of the proposed Laundry:

1.	Construction Cost
2.	Machinery and equipments
3.	Furniture and fixtures

1.1 Construction cost:

Laundry department is built inside Medical college premises in a separate plot.

I talked to the contractor of various projects inside Medical College to seek details regarding plot size, built up area and cost of construction (approx.) that occurred, when Laundry was built in 2008.

Plot Size=10,000sq.ft

Built up area =2000 sq ft. (Only ground floor)

Cost of construction: it is taken as 400 Rs. Per sq.ft

Cost of construction = 800,000

- ❖ Please note that land cost is not included in fixed cost/ Project cost as it is a government setup and laundry department is within the Hospital building.

1.2 Machinery and Equipment:

Following tables provides list of machinery and equipment with the unit cost that is installed in the Laundry of Medical College:

- ❖ A mail was sent to XCEL PVT. Ltd. requesting them to provide details of cost of each machine. Below rates are in according to the catalogue and quotation that was sent by the company⁽⁸⁾

Machinery and equipment:						
Description	Model. No.	Capacity	No.	Cost per unit:	Total cost:	Status:
XCEL industrial washing machine	WS-140	100Kgs	2	3,42,000	6,84,000	In use
XCEL Hydro Extractor	H2 50	50Kgs	2	1,72,000	3,44,000	In Use
XCEL Drying Tumbler	BT-100	100Kgs	2	3,40,000	6,80,000	Not in Use
XCEL Fibramatic dry cleaning machine	DC-508	25Kgs	2	13,25,000	26,50,000	Not in Use
TOTAL COST					4,358,000/-	

2.3 Furniture and fixture:

Details of the furniture and fixtures used in Laundry are given below ⁽⁷⁾:

Furniture and fixture:			
Description	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
Iron racks (10/15ft)	10	5,000	50,000
Counter table	1	8,000	8,000
Chairs	4	2,000	8,000
Stool	4	1,000	4,000

Exhaust Fan	2	2,000	4,000
Fan	10	1,500	15,000
Water dispenser	1	3,000	3,000
Electric wiring and lighting	2	15,000	30,000
Air cooler	1	5,000	5,000
TOTAL COST			127,000.00

Project Cost:		Depreciation:
Construction cost	8,00,000.00	5%
Machinery and equipment	43,58,000.00	5%
Furniture and fixture	1,27,000.00	8%
Pre-operating cost	-	
TOTAL PROJECT COST:	52,85,000.00	

2. Monthly Variable Cost/ Operational Cost:

1.	Human resource
2.	Machinery maintenance
3.	Direct electricity
4.	Direct water
5.	Direct gas
6.	Chemicals used
7.	Transportation cost (driver + fuel + vehicle maintenance)
8.	Communication expense (telephone + internet)
9.	Stationary

2.1 Human Resource:

Human Resource :				
S.No.	Designation	No. Of unit:	Salary per unit	Salary per month
1	Supervisor	1	7500	7500
2	Worker	4	6000	24000
3	Tailor	1	7000	7000
	TOTAL			38,500

2.2 Machinery Maintenance:

Information regarding machine maintenance is taken from supervisor. As such, there is no regular maintenance but service is done once in every three months, that cost around 2,500 -3,000 rs.

2.3 Raw Materials/Chemicals used:

Raw material used for washing Linen in laundry is Nirma washing powder, soda and caustic. Bleach is also used especially for white clothes.

Detergent is used for simple washing i.e. washing soap and Nirma. The main raw materials required along with their usage are listed below.

Information regarding different chemicals used for washing clothes and its cost, was taken from supervisor of Laundry department

Raw material/ Chemicals used					
Description	Quantity used per 50 kgs/one washing cycle	Rate per unit (kg)	Total Cost per 50kgs	Total cost per 200Kgs/day	Total cost per Month(25 working days)
Soda	750gms	50/-	37.5	150	
Caustic	100gms	100/-	10	40	
Nirma washing powder	500gms	150/-	75	300	
Bleach	750ml	100/-	75	300	
TOTAL COST			197.5	790/-	19,750/-

❖ Approx. 200Kgs of Linen is washed per day in the laundry department

2.4 Direct Electricity:

There is no separate metre in the Laundry department. So, electricity expenditure is calculated on the basis of daily usage of each machine and corresponding load of each machine.

Description	Load	Machine usage in a day:	kWh per day	No. Of Units/ machines:	Total kWh per day	Total unit per day: (1kWh=1unit)	Total unit per month: (25 working days)	Total electricity expenditure per month: (1 Unit=8rs.)
XCEL industrial washing machine	5HP,6.5KW	5 hrs	32.5	2	65	65	1625	13,000
XCEL Hydro Extractor	3HP, 4KW	2	8	2	16	16	400	3,200
Miscellaneous								750

us (Lights, fans, exhaust)								
Total electricity expenditure								16,950/-

2.5 Direct water:

The water comes from boring so there is no water bill but a motor runs for 5 hours, so, it is included in the electricity head.

2.6 Transportation Cost:

There is no transportation cost as no vehicle is used to transport linen. A hand cart is used that has negligible maintenance

	Monthly Operational cost/Variable Cost:	
1.	Human resource	38,500
2.	Machinery maintenance	1,000
3.	Direct electricity	16,750
4.	Direct water	-
5.	Direct gas	-
6.	Chemicals used	19,750
7.	Transportation cost (driver + fuel + vehicle maintenance)	-
8.	Communication expense (telephone + internet)	-
9.	Stationary	-
	TOTAL COST	76,000/-

Statement of Cash Flow		
	Mar-16	
Expenses:		
Human Resource	38500.00	
Chemicals Used	19750.00	
Direct electricity	16750.00	
Machinery maintenance	1000.00	
Direct Gas	-	
Water Used	-	
Transportation cost	-	
Communication expense	-	
Depreciation:		
Construction Cost	1533.33	(2.3% depreciation)

Machinery & equipment	18158.00	(5% depreciation)
Furniture and fixtures	847.00	(8% depreciation)
Total Expenditure	96,538.33	For the month of March'16

Standardised weight of Linen and Total Linen washed in the Laundry in the month of March 2016:

The linen collected on the day 1 was segregated into different items and listed. All the items of a particular category were weighed using median way of mathematical calculation. This gave me a standard weight of an item.

Subsequently, the total weight will be calculated by multiplying total number of items by its respective weight for a particular category. The data would be recorded on a pre-designed excel spread sheet.

Table. 1: Types of Linen and their weight						
Type of Linen:	1st piece	2nd piece	3rd piece	4th piece	5th piece	Median (grams)
Apron.						
Pt. Drape plane	100	155	160	165	210	160
Pt. Drape cutting	215	225	235	245	255	235
Apron.	360	370	400	430	440	400
Sponge	36	38	39	42	45	39
Bedsheet	620	620	628	655	683	628
Blanket	1425	1445	1450	1500	1565	1450
Kurta	80	110	125	140	160	125
pajama	114	177	183	236	245	183
curtain	333	432	456	505	520	456
Towel	530	580	631	660	760	631
red sheet	580	610	632	680	700	632
general sheet	590	593	610	665	683	610

Table 2			
Weight / Unit Wise Distribution of Product Mix per Day :			
Type of Linen :	Avg. Weight per type of linen (kg) :	Number of type of linen in March :	Weight of type of linen per Month day(kg):
Khol	0.8	164	131.2
Curtain	0.52	106	55.12
Apron	0.44	1998	879.12
Red sheet	0.7	230	161
General sheet	0.683	260	177.58
Plain sheet	0.21	1098	230.58
Cut Sheet	0.255	1354	345.27
Towel	0.76	1418	1077.68
Sponge	0.045	422	18.99
Kurta	0.16	150	24
Bedsheet	0.683	4990	3408.17
Pajama	0.245	76	18.62
Total Weight	<u>6527.00</u>		

*None of the ward had even an extra set of linen for their beds; ideally, there should be at least 4-6 set of linen for each bed.

Cost of washing one kg of linen in Maharani Laxmi Bai Medical College, Jhansi = Total Monthly Expenditure/Total weight of Linen generated in a Month

- ❖ Total monthly expenditure incurred = 98538.33
- ❖ Total weight of Linen generated in a month = 6527 kgs

Cost of washing one kg of linen in Maharani Laxmi Bai Medical College, Jhansi = 98538.33/6527 = 14.79/-

Findings:

- The cost incurred in setting the laundry unit in Maharani Laxmi Bai Medical College, Jhansi was Rs. 52,85,000.00
- **The cost of washing One kg of linen is four times higher (14.79 Rs/kg), in Maharani Laxmi Bai Medical College, Jhansi**
(Based on information obtained from unpublished data and discussion with different Laundry managers of various hospitals Laundry)
- Laundry is running at below 50% of its operational capacity.

Recommendations:

- Linen from 10 IPD wards (ward 1-ward10) and 4-5 other different wards (Emergency Ward, Emergency OT, Routine OT, Labour Room and some ICU's) are washed in this laundry. There are other 8 wards for which they have a separate old laundry (18 years old). Linen from all the wards should be washed in one facility, that will increase the operational capacity and reduce the cost of washing per kg of linen
- Drying tumblers are the latest machines used instead of hydro extractors that consumes less electricity (<50%), so, these machines should be made operational. It will increase the efficiency and will reduce the cost of washing per kg of linen⁽¹¹⁾.
- Dry cleaning machines should also be made operational. They increase the life of linen by 30% and give a better quality wash.⁽¹¹⁾.

(11) On discussion with different Laundry managers of various hospitals Laundry

- During the course of study, one observation was that none of the ward had even an extra set of linen for their beds; ideally, there should be at least 4-6 set of linen for each bed⁽¹²⁾. So, it is recommended that every bed in ward should have an extra set of linen. That again will increase the efficiency of Laundry, quality of care, will reduce infection rate and will also reduce the cost of washing per kg of linen

Conclusion:

Hospital Laundry and linen services are not revenue generating and hence has not been given the priority it deserves. Although, the clean bedding and clean clothes installs psychological confidence in the patients and the public and enhances their faith in the services rendered by the hospital.

An inefficient and mismanaged laundry service in a hospital bears an additional cost, reduces quality of care and increases infection rate. It should be given priority like any other clinical services. Efficient supply of linen without any defect and delay in time

becomes a good support towards delivering timely quality healthcare services to the patients.

Limitation of data collection:

REFERENCE:

- ⁽¹⁾ www.transparencymarketresearch.com/hospital-linen-supply-management-services.html
- ⁽²⁾ www.articles.economictimes.indiatimes.com/2011-03-20/news/29148031_1_retail-outlets-indian-garments-laundry
- ⁽³⁾ <http://www.slideshare.net/NcDas/planning-manag-of-hospital-laundry>
- ⁽⁴⁾ www.archivehealthcare.financialexpress.com/200905/strategy01.shtml
- ⁽⁵⁾ www.cdn2.hubspot.net/hub/276565/file-491155354-pdf/docs/outsourcing-linen-services.pdf
- ⁽⁶⁾ *Hospital Administration and Human Resource Management* by D.K. Sharma and R.C.Goyal
- ⁽⁷⁾ Document no. PREF-78 (REVISION-4) "Pre-Feasibility study, Laundry and sry cleaning. Prepared by SMEDA-Punjab
- ⁽⁸⁾ www.xcelstiro.com
- ⁽⁹⁾ Support and utility services module, IIHMR University, Jaipur