

Costing of Inpatient Services at a Superspeciality Hospital in India

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Abstract

The recent years have seen great change in social and political scenario all over the developing world due to the liberalisation in economic and trade practices. Their impact permeated to the health and medical care delivery system resulting in import of high technique equipment and medical practices, thus leading to escalation in cost of medical care. The present study was conducted to find out the cost of inpatient care services at tertiary care hospital in India. The cost of material, manpower, capital cost including depreciation on building, equipment, fixed assets, air conditioning and the cost of inhouse support and utility services like CSSD, Blood Bank, dietary services, laundry, manifold room, medical records department, security services, hospital administration, etc. was calculated. The cost of inpatient care per bed per day came out to be Rs. 1000/- (approximately) and the staff salaries, expenditure on laboratory, radiological services and the disposable items were the major cost centres. The study can help as guidelines for hospital administrators for scientific costing in their hospitals.

Key words

Cost Centre, Costing, Fixed Cost, Variable cost, Activity based costing, Depreciation, Cost of inpatient per day

Introduction

The cost of inpatient care is increasing in hospital due to increased use of high technique equipment and ever increasing expectations of the consumers. There is no idea of actual expenditure of patient care incurred by the hospital. The budget allocation is also done in arbitrary manner and is not need based. Presently, in most of the hospitals, medical record sections is assigned the responsibility of calculating the cost of patient care, based on simple calculation of dividing total expenditure with total number of discharges. No costing technique is applied. No provision have been made for incorporating overheads such as expenditure on support and utility services, depreciation of equipment and building, electricity and water etc. which has become an important component of the total cost. Keeping in view the changing

trend of privatisation and globalisation of health care services and introduction of multinational companies in health insurance sector, it has become mandatory for the hospital to have scientific methods and practices in Cost Accounting so as to provide accurate information of cost of patient care and also extend of variation depending upon clinical diagnosis, personal characteristics of the patient like age, sex, physician and administrative subjectivity(1). The comparative costing of patient care services at selected speciality wards in AIIMS was carried out in the present study.

Material and Methods

The study was conducted in four phases, in **phase-1** review of the published literature was carried out to understand the methodologies of costing in the hospitals

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which were invogue in various institutions in India and abroad. An observation study of 15 days was carried out to have preliminary information regarding the ward under study. In **Phase II**, a prospective study of 6 months duration was carried out to find the cost of material supplies by the hospital and those procured by the patients admitted on first fifteen beds in two wards. These patients were followed from admission to discharge. A pretested proforma was attached with nurses daily record sheet. The cost of material which can be directly apportioned to individual patient including drugs purchased by the attendants of the patient from the market for 50 beds in two wards was calculated as **Annexure 1**. The cost of commonly used items which cannot be directly charged to the patients including general store items used for sanitation work, surgical, medical and stationery store items like guaze, bandage, spirit, savlon, investigation forms and other printed material was calculated. In **phase III** expenditure on nursing staff, hospital attendants, sanitary attendants and other staff was calculated on the principle of activity sampling technique(2) of work measurement. The time devoted to direct and indirect patient care by these categories of staff was also calculated(3). A Pilot Study was carried out for three shifts in each ward to establish a general pattern of time utilization. The monthly remunerations of each category of staff inclusive of DA, MA, HRA, EHS etc. were apportioned based on percentage of direct and indirect activities. The salary of faculty and residents was apportioned as per the assumption that faculty and senior residents spent 67% and junior residents 50% of their time in the wards(4). In **Phase IV**, the capital cost on account of building, equipments fixed assets, air conditioning, comprehensive equipment maintenance per annum, variable expenditure on water and electricity was calculated as per the proforma annexed as **Annexure 2**. The overhead cost on the hospital inhouse support and utility services like CSSD, blood bank, medical record, central admission, hospital security, medical gas supply, hospital administration etc. was calculated after

consideration of total cost (Fixed + variable) (5) of respective departments as per the proforma annexed as **Annexure 3** and then dividing it with number of beds in the hospital using these facilities to find out the cost per patient per day. Finally the data was scientifically organised and presented by simple statistical methods to identify major cost centres and important variables determining cost of services.

RESULTS

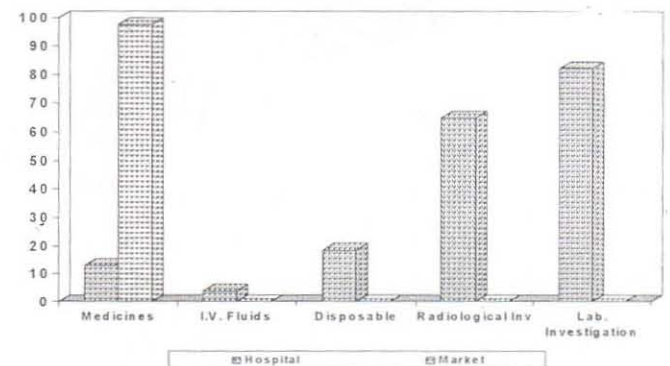
Cost Calculation

A. Cost of Material

- a) The cost of the material which can be directly apportioned to individual patient:

The cost of items supplied by the hospital in ward A was Rs. 13.06 per patient per day and the cost of drugs purchased by the attendants from market was Rs. 97.52 per patient per day. The cost of disposable items, IV fluids, radiological and laboratory investigations were Rs. 18.41; Rs. 3.83; Rs. 64.98 and Rs. 82.18 per patient per day respectively.

The cost of items supplied by the hospital in ward B was Rs. 11.75 per patient per day and the cost of drugs purchased by the attendants from market was Rs. 79.35 per patient per day. The cost of disposable items, IV fluids, radiological and lab investigations were Rs. 15.77; Rs. 3.40; Rs. 66.85 and Rs. 86.46 per patient per day respectively.

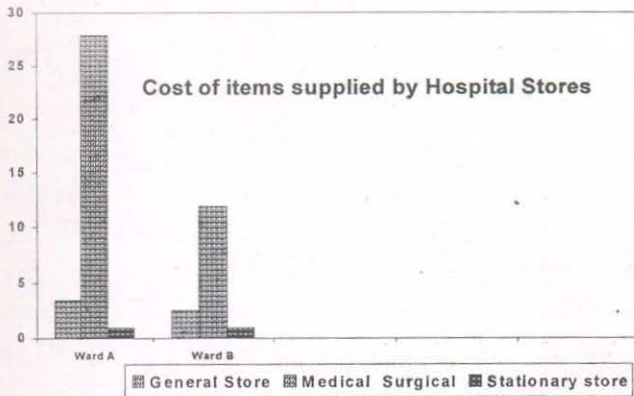


- b) The cost of commonly used items which cannot be directly charged to patients:



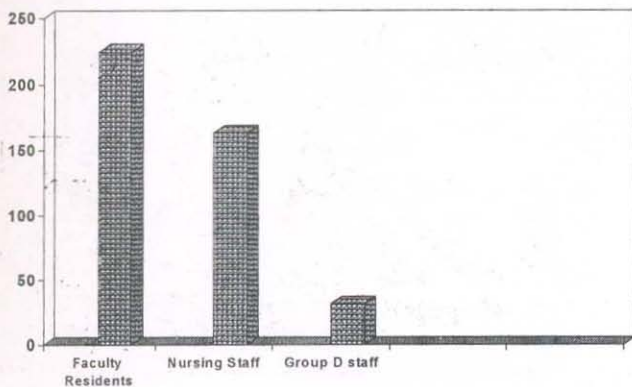
The average consumption in ward A for general store items was Rs. 3.45 per patient per day and for medical and surgical store items was Rs. 27.90 per patient per day and stationery store items it was approx. Re. 1.00 per patient per day.

The average consumption in ward B for general store items was Rs. 2.56 per patient per day and for medical and surgical store items was Rs. 11.84 per patient per day and stationery store items it was approx. Re. 1.00 per patient per day.



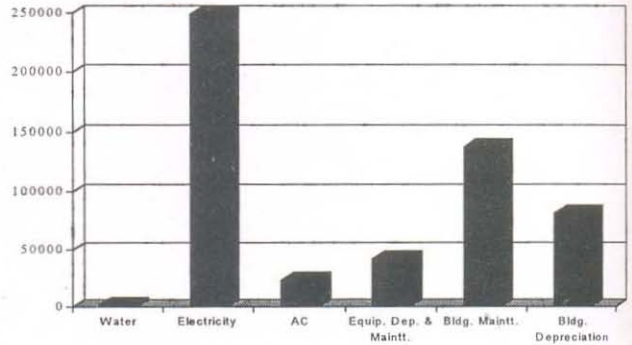
B. Cost of Manpower

The cost of nursing manpower came out to be Rs. 163.35 per patient per day, group D employees Rs. 31.08 per patient per day and faculty and residents it came out to be Rs. 223.35 per patient per day in ward A and in ward B cost of nursing manpower came out to be Rs. 118.08 per patient per day, group D employees Rs. 31.08 per patient per day and faculty and residents it came out to be Rs. 213.42 per patient per day .



C. Capital Cost

The capital cost on account of building equipments, fixed assets, air conditioning came out to be Rs.40.60 per patient per day and Rs. 36.28 per patient per day in Ward B.



D. Cost of In-house Support and Utility Services

The percentage of cost expenditure-cost centre-wise for the inhouse and support and utility services was as under:

A. Fixed Cost	% of the total cost
1. C.S.S.D.	1.83
2. Blood Bank	4.02
3. Central Admission Enquiry Office	0.41
4. Medical Record Section	0.74
5. Hospital Security	1.54
6. Medical gas supply services/Manifold	1.91
7. Dietary services	2.98
8. Hospital sanitation and housekeeping	7.77
9. Hospital administration and stores	3.55
10. OPD for each admission	2.56
11. Waste disposal	0.59
12. Laundry and Linen	1.18
13. Salary (Faculty Residents, nursing & Group D)	44.06
14. Capital cost in ward Civil/A.C./ Electrical/Equipment/ward furniture	4.28
B. Variable cost	
15. Drugs, disposables & IV fluids (from hospital)	3.71
16. Lab & radiological investigation	15.47
17. General store, medical, surgical and stationary store items	3.40
18. Drugs (From market) 10% of total cost	
Total cost	100.00



Discussion

The expenditure on inpatient care in one ward came out to be Rs. 1048.02 per patient/day and in other ward it was Rs. 932.71 per patient/day. The cost of patient care on an average for a tertiary care hospital was found to be Rs. 1000/- per patient/day which seems to be very low when compared with countries like USA, where the cost of inpatient care in average community hospital was Rs. Rs. 41,600/- per patient/day(6). But for country like India even this cost appears to be quite high when compared to per capita income of an average Indian. The 90% of the total cost was borne by the hospital where as 10% of the cost of the care was borne by patient themselves. The cost of patient care in one ward was more because of the reason that patients of more serious nature were admitted in that ward and that ward also had an Intensive Care Unit with 8 beds and another 4 beds of Haematological Nursing Care where more resources (material/manpower) were consumed. The major Cost Centres which consumed the hospital resources were salaries(40%). The human resource is most important and expensive component of the patient care in the present study and in study conducted by Nancy, it was documented to be 60% of the total cost of patient care(7). The present study also shows that laboratory and radiological investigation 15%, expenditure as drugs/disposables 10.5%, depreciation on account of equipment, building and furniture 3.8%, expenditure on account of providing Blood Bank facilities to indoor patients as 3.5% of total cost.

Hospital sanitation and house-keeping which is also very important for patient care consumed 7% of the total cost. The expenditure on drugs and disposables which is another major cost centre consumed 14-15% of the cost, out of which 3-4% was supplied by the hospital whereas about 10% was purchased from market by the attendants of the patient. The study

also gives good idea about expenditure on support and utility services, depreciation on account of equipment, building and furniture etc. in addition to electricity and water charges. These cost centres appears to be very small but if we calculate the total cost on these cost centres it will constitute a major component of the total cost but unfortunately these overheads are ignored while calculating the costs in the hospitals.

The reasons for high cost on account of investigations were exhaustive investigations written by the consultants for diagnostic and treatment, duplication and multiplication because of more number of consultants in the wards, loss of reports in transit, inadequate samples send to the labs, different samples of same person to counter check the results etc.

Conclusion

The study led to the conclusion that there is no clearly laid down policy regarding the items to be provided by the hospital and those to be arranged by the patients themselves, so attendants were found running around at odd hours and purchasing these medicines at higher rates. It was revealed that there is no cost awareness amongst the hospital personnel regarding the cost of different items, more such studies should be conducted and cost of each procedure should be known, so that they become cost conscious. The study also showed that there is ambiguity in job description of different categories of employees and also inappropriate/inadequate utilization of manpower, particularly Group D employees. So proper job description/utilisation of manpower will help to reduce the cost of patient care. It is also suggested that posting of clerks in the wards should be considered who would free the nurses of non-nursing jobs and similarly some of the services like transportation of samples and specimen, collection of indents, giving equipments for repair in workshop, collecting investigation from lab and X-ray department etc. should be centralized for better utilisation of time of Group-D employees.

It is also suggested that there is a need to establish standard operating procedures, minimizing malpractices/errors/law suits. There should be close monitoring for efficiency, productivity and cost effectiveness, which can be done by allegning the staffing pattern and patient activities, minimizing the need of overtime, extra staff etc. and having adequate number of staff with right qualifications at right time.

ANNEXURE 1(Self Designed after prospective study of 15 days)

S no	No. of days	Medication		I.V. fluids		Disposables		Radio-logical	Lab. Investiga-tion	Linen	Medical Gas
		Hospital	Market	Hospital	Market	Hospital	Market				

ANNEXURE 2

1. Cost of building(AIIMS, Civil Engg. Records)
@ Rs. 900/sq.ft (3200 sq.ft. X 900)
Depreciation (8)
@ 1% of capital cost/year
(Assuming life of building to 100 years)
2. Cost of building maintenance(Directorate of CPWD, Memo No. 10011/12/75-POL-II of October, 90)
@ Rs. 15.20/sq.ft.after adding inflation at present rates
3. Cost of fixed assets Electrical (8)
Depreciation @ 5% annually
4. Cost of equipment(8)
Depreciation @ 10% of the capital
Equipment maintenance @ 5% of the capital cost annually
5. Salary & wages (Scales of pay, AIIMS Act, Rules and Regulations)
Variable cost

1. Supplies (Majority of rates are of National Consumer Cooperative)

2. Electricity (DESU rates)

3. Water (MCD rates)

Total Cost = (Fixed + variable cost)

ANNEXURE 3

Nomenclature	Cost Base	Authority
CAPITAL COST		
Building cost	Rs. 900/sq.ft.	Civil Engineering records
RECURRING COST		
Salaries	Pay & Allowances including EHS	Scales of pay hospi-tal Act, Rules and Regulations
Materials/ supplies	Actual cost paid/ rate list of stores	Majority of rates are of National Consumer Cooperative
Depreciation method	Declining balance Services 1% of the capital cost assuming the life of building 100 years. 5% of the capital cost(electrical gadgets). 10% of the capital cost (equip. & ward furniture)	Tata Consultancy
Electricity	Rs. 2.40/KW	DESU Rates
Water	Rs. 5.00/tap/month	MCD Rates
Building Maintenance	Rs. 15.20/sq.ft. area after adding inflation at present rates	Directorate of CPWD memo No. 10011/12/75-POL-II of Oct.,90.
Comprehensive Equipment Maintenance	5% of the capital cost	Tata Consultancy Services
Central Air-Conditioning	Maintenance cost Operational cost	Actual

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