



## A STUDY ON UNIT COST OF DIET IN A TERTIARY CARE GOVERNMENT HOSPITAL

### Management

**Dr. Nitin Dutt Bhardwaj**

Associate Professor, Department of Hospital Administration, KGMU, Lucknow.

**Dr. John Paul G. Momin\***

Resident, Department of Hospital Administration, KGMU, Lucknow \*Corresponding Author

**Dr. Supriya Singh**

Resident, Department of Hospital Administration, KGMU, Lucknow.

**Dr. Amit Kumar**

Resident, Department of Hospital Administration, KGMU, Lucknow.

### ABSTRACT

**Aim:** To study the diet cost per meal per patient admitted in a Tertiary Care Government Hospital. **Objectives:** To estimate direct cost, indirect cost and total unit cost of various types of diets. **Methodology:** It was a cross sectional, observational and descriptive type of study conducted in a tertiary care government hospital over a period of 4 weeks. **Results:** It was observed that the total cost of Normal diet was ₹122.8 per day per diet and ₹130.5 per day per diet for high protein diet.

### KEYWORDS

Diet cost , Direct cost, Indirect cost, Total Unit Cost.

### INTRODUCTION:

Diet plays a vital role in the treatment and recovery of patients. The dietary department not only caters to the patient's food requirement but they are responsible for planning, prescribing and counseling patients about their diet according to their diseased conditions<sup>[1]</sup>. Quality of hospital food services has a critical effect on patient satisfaction which in turn influences the patient's perception of the quality of the services provided by the hospital<sup>[2,3]</sup>. The importance of hospital food services is vital but when comparing with other clinical activities, meal services are more prone to be subject to a budgetary cut than other services<sup>[4]</sup>. Therefore it is difficult to find the balance between delivering quality food services and appropriate costs mainly because of the lack of competencies required to perform this task and tools to enable proper management of the services. The provision of hospital meals is a difficult process aggravated by the potential of patient's malnutrition.

Cost effectiveness of appropriate healthcare services is a very important domain that needs to be addressed in order to minimize the growing gap of health requirements between available and required needs and resources. These gaps may be due to deviated social, demographic and epidemiological changes in developing countries. However this difficulty can be effectively overcome by handling current available resources more effectively through upgraded allocation patterns and maximized efficiency in management of hospitals<sup>[5]</sup>.

Information taken from costing studies help in cost savings in hospitals. The three main methods of cost analysis are the direct method, step-down method and the reciprocal method. Majority of the costing studies done across the globe have been done by applying either direct method or step- down method and out of the two the later was found to be more accurate, less costly and less time consuming. The objective of the dietary service is providing clean, hygienic and nutritious diets for the indoor patients according to calorie and nutritional requirement. Thus, nutrition is an important determinant of health for any patient and as such its cost analysis is of utmost importance especially in health systems which manage with scarce resources<sup>[6,7]</sup>.

**Aim :** To study the diet cost per meal per patient admitted in a Tertiary Care Government Hospital.

**Objectives :** 1) To estimate the direct cost of various types of diets. 2) To estimate the indirect cost of various types of diets. 3) To estimate the total unit cost of various types of diets. 4) To suggest recommendations, if any.

**Methodology:** The study was conducted in tertiary care Government hospital. It was a cross sectional, observational and descriptive type of study conducted over a duration of 4 weeks. The data was collected by

observational checklist. Parameters taken were list of various types of diets, analysis of all components of direct and indirect cost (raw materials, depreciation, administration, manpower, transportation, LPG, electricity, equipment maintenance, miscellaneous) & analysis of total cost per day per diet.

### RESULTS:

On an average a total of 2500 diets were distributed in the hospital per day . There were 8 types of diet out of which it was observed that the highest distribution was of normal diet and high protein diet. Various types of diet and their average consumption are shown in the table below:

**Table 1: Type of Diet & Consumption**

S. No.	Name of Diet	Per day consumption	
		f	% N=2500
1	Normal diet	1600	64
2	High Protein Diet	700	28
3	RT Diet	75	3
4	Semi solid Diet	50	2
5	Diabetic Diet	30	1.2
6	Paediatric (1-3 years) Diet	10	0.4
7	Paediatric (4-6 years) Diet	15	0.6
8	Paediatric (7-12 years) Diet	20	0.8

### Cost of Diet

Direct and indirect cost incurred for all types of diet was calculated by historical method. All three components (material, manpower and overhead expenses) of direct and indirect cost were calculated. The details of all costs are given in the table below:

**Table 2: Direct Material Cost**

S. No.	Type of Diet	Cost in ₹ per day per diet
1	Normal diet	69.39
2	High Protein Diet	77.09
3	RT Diet	57.79
4	Semi solid Diet	61.39
5	Diabetic Diet	62.58
6	Paediatric (1-3 years) Diet	48.67
7	Paediatric (4-6 years) Diet	61.21
8	Paediatric (7-12 years) Diet	73.71

It was observed that the maximum cost incurred was on high protein diet. No indirect cost was identified for materials.

**Table3: Manpower cost**

S. No.	Type of Cost	Direct Cost in ₹ per day per diet	Indirect Cost in ₹ per day per diet
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1	Staff salary	21.7	1.22
2	Staff uniform	0.42	0.04
3	Staff bonus	1.49	0.14
4	Staff room rent	0.96	0.2
5	Food allowances	2.77	0.14
6	staff welfare	0.26	0.05
7	Medical expenses	0.9	0.05
	<b>Total manpower cost</b>	<b>28.5</b>	<b>1.84</b>

It was observed that the maximum cost incurred was on salaries of staffs. Direct cost of manpower is significantly higher than indirect cost.

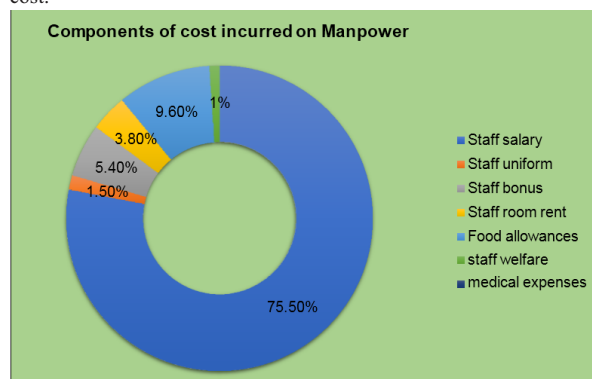


Figure 1: Components of cost incurred on Manpower

Table 4: Overhead Expenses

Direct Overhead Expenses		Indirect Overhead Expenses	
Name of item	Cost in ₹ per day per diet	Name of item	Cost in ₹ per day per diet
LPG	3.744	Administration	0.8
Electricity	1.2	Transportation	0.06
Transportation	3.5	Equipment maintenance	0.013
Cleaning	1	Miscellaneous	8.133
Depreciation on fixed assets	2.52	<b>Total indirect overhead</b>	<b>9.006</b>
Equipment maintenance	2.1		
<b>Total direct overhead</b>	<b>14.064</b>		

In overhead expenses, it was observed that the maximum direct cost incurred was on food preparation /cooking. Depreciation cost of fixed assets and equipment maintenance cost were also found to be significant.

Table 5: Direct cost

S. No.	Type of Diet	Material Cost in ₹ per day per diet	Manpower Cost in ₹ per day per diet	Overhead Expenses in ₹ per day per diet	Total Direct Cost in ₹ per day per diet
1	Normal diet	69.39	28.5	14.064	111.954
2	High Protein Diet	77.09	28.5	14.064	119.654
3	RT Diet	57.79	28.5	14.064	100.354
4	Semi solid Diet	61.39	28.5	14.064	103.954
5	Diabetic Diet	62.58	28.5	14.064	105.144
6	Paediatric (1-3 years) Diet	48.67	28.5	14.064	91.234
7	Paediatric (4-6 years) Diet	61.21	28.5	14.064	103.774
8	Paediatric (7-12 years) Diet	73.71	28.5	14.064	116.274

It was found that the total direct cost was highest for high protein diet. Total Indirect cost= Indirect manpower +indirect overhead expenses  
Total Indirect cost= 1.84 + 9.006 = ₹ 10.846 per day per diet

Table 6: Total Cost

S. No.	Type of Diet	Total Direct Cost in ₹ per day per diet	Total Indirect Cost in ₹ per day per diet	Total Direct Cost in ₹ per day per diet
1	Normal diet	111.954	10.846	122.8
2	High Protein Diet	119.654	10.846	130.5
3	RT Diet	100.354	10.846	111.2
4	Semi solid Diet	103.954	10.846	114.8
5	Diabetic Diet	105.144	10.846	115.99
6	Paediatric (1-3 years) Diet	91.234	10.846	102.08
7	Paediatric (4-6 years) Diet	103.774	10.846	114.62
8	Paediatric (7-12 years) Diet	116.274	10.846	127.12

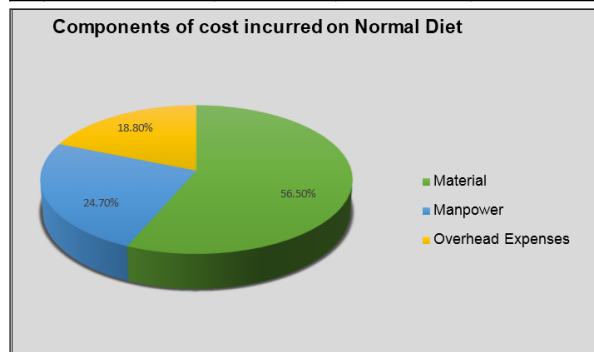


Figure 2: Distribution of cost components of Normal Diet

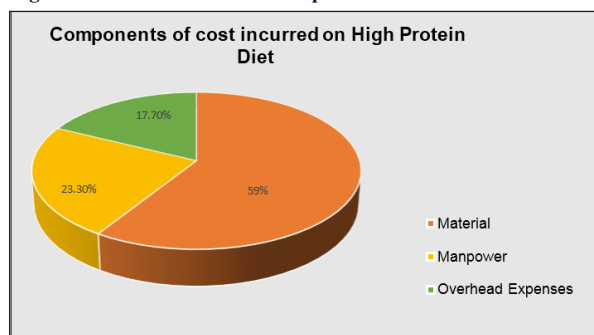


Figure 3: Distribution of cost components of High Protein Diet

It was observed that the maximum cost incurred was on procurement of materials followed by manpower in both normal diet as well as high protein diet.

### CONCLUSION:

In KGMU, being a government institution diets are provided free of cost, but for private ward patients the diet is chargeable. A study done in PGIMS Rohtak and other national studies on diet costing show similar results as our study. Major funds were utilised for normal and high protein diet. Cost reduction can be done by prevention of wastage of materials.

### Recommendations

- To assess the quality of diet provided in the private wards further satisfaction survey needs to be done.
- To assess the factors for wastage of material and their probable solution, further study needs to be conducted.

### REFERENCES

- NEIGRIHMS dietary services (<http://neigrihms.gov.in/dietary.html> last visited on 13/01/20)
- Huang-Ti N-CSW, Veith I: Huang Ti Nei Ching Su Wen: The Yellow Emperor's Classic of Internal Medicine. Berkeley and Los Angeles: University of California Press; 1966. 4.
- Cardello A: Hospital Patient Feeding Systems. Washington, DC: National Academic Press; 1982

4. Hartwell HJ, Edwards JSA, Symonds C: Foodservice in hospital: development of a theoretical model for patient experience and satisfaction using one hospital in the UK National Health Service as a case study. *Journal of Foodservice* 2006, 17(5-6):226-238.
5. Newbrander W, Lewis E. Hospital costing model manual. Report for USAID Health Reform and Financing Program & APHIA Financing and Sustainability Project. Management Sciences for Health, 1999.
6. Rathnayake RMSS, De Silva D. Diet cost of patients in teaching hospital Kalubowila. *Anuradhapura Medical Journal* 2016; 10: 1-5.
7. Buki A. New studies calculate cost of medical services in Indian hospitals. The Center for Disease Dynamics, Economics & Policy 2013. Center for Disease Dynamics, Economics & Policy: Washington, DC.