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Cost of patient and staff diet in Teaching Hospital Karapitiya, Galle

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Abstract

Background: Government hospitals in Sri Lanka offer all services free of charge including the patient diet. Currently patient care services are affected by increasing health care cost in state hospitals. Cost cutting measures are essential in health care management in public sector without sacrificing the standards of care provision. Analysing hospital diet costs is crucial to figuring out how to save indirect operating costs while maintaining service quality and standards.

Objective: To determine the cost of diet for patients and staff in the Teaching Hospital, Karapitiya.

Methods: A descriptive cross-sectional study was carried out retrospectively to determine the cost of patient and staff diet. The step-down costing method was used in this study, and secondary data was collected from kitchen records, the diet branch and the finance branch during the month of August 2023.

Results: The total expenditure for the diet during the period was 9,864,157 LKR and per unit cost was 182.76 LKR to provide diet for patients and staff. The cost of breakfast, lunch and dinner was, 117 LKR, 225.39 LKR and 179.5 LKR respectively.

Conclusion: The unit cost for diet was higher compared to previous Sri Lankan hospital study findings but lower than the present market price. Separate registers to record capital items and consumables are recommended to determine the diet cost in future and for the interventions to improve quality and reduce the cost.

Keywords: Patient/Staff diet, costing, Teaching Hospital Karapitiya

Introduction

Being a developing country, Sri Lanka's health statistics are above average in relation to its socioeconomic level. These health outcomes are primarily the result of a well-managed government health-care system. Sri Lankan government hospitals give all services free of charge. In addition to diagnostic and treatment services, dietary services are an important aspect of hospital facilities [1].

Nutrition is a critical part of health. A healthy diet helps to maintain good nutritional status and to protect against diseases [2]. Nutrition is a major determinant of a proper patient's health outcome. Malnutrition is a cause of impaired immunity which leads to an increased risk of health-care-associated infections, impaired and delayed wound repair, increased morbidity, increased length of hospital stays, and increased mortality [3].

The needed nutritional requirement varies from patient to patient according to their nutritional status and disease condition. Therefore, malnourished patients need more healthcare resulting in high expenditure. During the hospital stay nutritional requirements are assessed by

medical professionals and supplied according to a general circular which is issued by the Ministry of Health to supply diets to patients and health assistants in government medical institutions [4].

The duration of a hospital stay is a key indicator of the efficiency of a hospital. The longer hospital stay increases the requirement for additional nutritional support and cost. Cost-effectiveness is a very important aspect that needs to be considered to minimize the gap between healthcare expenditure and available resources [5].

Controlling expenses is a main challenge in any institution. Especially in hospitals, there is increasing health care cost due to the change of age distribution and use of new technology. Cost reduction methods need to be applied without compromising the quality of care [6]. A research carried out to study the impact on health care quality dimension in hospitals revealed that the efficiency of healthcare services depends on the measures that are taken to maximize using of resources and avoid the waste of resources [7].

A study carried out in India on unit cost of diets in a tertiary care government hospital showed that their major funds were utilized for normal and high protein diet and recommended to assess the factors for wastage of materials [8]. A research done on cost management model indicated that activity-based costing systems have positive effects on the reduction of costs for the nutrition department [6]. The current economic status leads governments towards cost-effective solutions. As a result, there is a need for accurate data on healthcare expenditure to use in policy-making and management [6].

Studying the cost of a hospital diet is important to find ways to reduce indirect operational costs and increase the quality of service as it functions with a daily supply of raw materials according to daily requirements. This information is useful to raise awareness among patients and health staff regarding the cost of diets supplied at wards to create positive attitudes and practices [9, 10].

Teaching Hospital Karapitiya (THK) is the leading tertiary care centre in the southern province. The number of admissions is increasing due to referrals for subspecialty care and the reputation gained by the institution. Therefore, hospital dietary service is an important service that should be maintained properly to establish the need of nutritional requirements and patient satisfaction [11].

Objective

To determine the cost of diet for patients and staff in the Teaching Hospital, Karapitiya

Methodology

This was a descriptive, cross-sectional study conducted retrospectively. The study was carried out at THK, Sri Lanka, which is the largest hospital in the Southern province of Sri Lanka, from August 1, 2023, to August 31, 2023. In this study, secondary data was collected by using a checklist/information sheet. The number of staff and cost of raw materials were obtained from service branch records. The number of meals distributed was determined by using secondary data from kitchen and diet branch records. The cost of gas, water, electricity, and salary was calculated using account branch records.

In this study, the step-down costing method was applied. The organization's overhead, intermediate, and final cost centres were determined using this method. However, as the kitchen cost centre does not include an intermediate cost, intermediate costs were not taken into account in this analysis.

Table 1: Cost centres of TH

Overhead	Final cost centre
Administrative office	Kitchen
Water	
Electricity	
LP Gas	
Cleaning Service	

All direct costs, including salaries, costs for kitchen raw materials, and stationary costs, were added together. The value of buildings and other kitchen utensils was not included in this study as buildings were more than 20 years old and all kitchen utensils were more than 5 years old. The administrative cost centre was distributed according to the number of units in the hospital, and the kitchen was considered as one of them. Then overhead costs (cost centres responsible for the proper functioning of intermediate and final cost centres) were apportioned to final cost centres (cost centres that were directly linked to patient care).

Overhead costs like electricity and water were calculated based on the square feet's area of the kitchen. The cost of cleaning services was according to the number of cleaning personnel working in the kitchen.

Administrative clearance was obtained from the director, Teaching Hospital Karapitiya.

Results

The total cost of the kitchen cost centre was calculated by adding all the salaries of kitchen staff, the cost of raw materials, and stationaries.

Table 2: Total cost for salaries of the kitchen staff

Category	Number	Total cost in LKR
Cooks	5	382,330
Diet stewards	5	362,020
Healthcare assistants	6	184,200
Diet clerk	15	947,700
Total		**1,876,250**

Other apportioned costs to the final cost centre (kitchen) are given below.

Water - Water to the kitchen was supplied from the house officer quarters, and the total floor area of the house officer quarters and the kitchen was 14075 sq. ft. The kitchen floor area was 3005 sq. ft, which is 21.3% of the total floor area. Therefore, the total water bill for that meter, LKR 130698.00, was apportioned to the kitchen.

Electricity - The electricity supply to the kitchen was from the oncology building meter. The same meter supplied the electricity to wards no. 01, 44, 45, consultant lounge, Ear Nose & Throat (ENT) ward, Eye ward, Paediatric Intensive Care Unit, and the oncology ward, which contain a total floor area of 148965 sq. ft, while the kitchen area is 2% of that area. Accordingly, the total electricity bill for the oncology meter was LKR 7,775702 apportioned to the kitchen cost centre. From the total administration cost, the portion for the kitchen was obtained by considering the units available in the

hospital, which were 135 (0.74%). Therefore, the total administrative cost of LKR 7,837,631 was apportioned accordingly.

The total costs for the kitchen cost centre are given in table 03.

Table 3: Total cost for kitchen cost centre

Overhead	Final cost in LKR
Total salary	1,876,250
Water	27,903
Electricity	156,885
Administration	57,998
Cleaning	45,235
Stationaries	12,525
Gas	434,890
Total	**2,611,686**

The total number of diet was calculated among 37601 patients and 16371 staff. Cost for diet at THK is given in table 04.

The costs for the three meals of the day were calculated and given in table 05.

Table 4: Diet cost calculation

Diet cost calculation		LKR
Cost for raw materials	=	7,252,471
Total cost at final cost centre	=	2,611,686
Total cost for diet	=	9,864,157
Unit cost for diet	=	9,864,157 / 53972
	=	**Rs 182.76**

Discussion

This study revealed that the average per patient and staff cost of diet in Teaching Hospital Karapitiya is LKR 182.76, which is still low when compared to the current market value. Two similar studies were conducted in Sri Lankan government hospitals in 2016 and 2022. The diet cost was calculated as LKR 119 [13] and LKR 127 [10] respectively. The price surge can be due to inflation and increased quality over time. Comparison between these studies is difficult due to changes in the type of hospital and the time gap. Furthermore, we considered the wages of diet clerks as a cost of the kitchen cost centre, and it was 50% of the total salaries of kitchen staff, which was not considered in the previous two studies.

The cost of the breakfast is LKR 117, which is comparatively lower than the other two meals. Lunch is the costliest meal, and THK spent LKR 225.39 for it, and dinner cost LKR 179.50. The cost of the fish was the most contributing factor to the high cost of lunch (55.5%). Separate costs for three meals were not given separately in previous studies conducted in Sri Lanka to compare the values of this study. Since hospitals provide diabetic, paediatric, and high-protein diets, in this study we couldn't calculate the cost for those meals separately due to the non-availability of cost data for raw materials for these meals separately. Therefore, the actual cost of a normal meal may vary a little from the given value.

Although calculating the number of units consumed is the best way of calculating electricity and water consumption, due to the non-availability of a separate bill for the kitchen area at THK, the cost of electricity and water was apportioned according to the floor area. This method has been used in both studies conducted in Sri Lanka [13, 10]. In a study conducted in Cairo at Ghamuria General Hospital, the consumption of electricity was measured using an Avometer [14]. However, the actual electricity consumption can vary due to the cost of different types of units, like intensive care units, wards, and consultant lounges, which were all on the same bill at THK. Similarly, the actual water

Table 5: Cost for each meal of the day

	Breakfast	Lunch	Dinner
Total number of meals served	14542	24070	15360
Percentage of meals from total number of diets	14542/53972 = 26.9%	24070/53972= 44.7%	15360/53972= 28.4%
Portion of final cost centre to the meal (LKR)	2,611,686 x 26.9% = 702,543	2,611,686x 45.5% = 1,188,317	2,611,686 x 28.4% = 741718
Cost of raw materials for the meal (LKR)	999,442	4,236,895	2,016,134
Total cost for the meal (LKR)	1,701,985	5,425,212	2,757,852
Cost for single meal (LKR)	1,701,985/14542 = **117.0**	5,425,212/24070 = **225.39**	2,757,852/15360 = **179.50**

consumption can vary due to higher consumption at the HO quarters.

Limitations

It is difficult to measure the actual consumption of electricity and water due to shared meters and to determine the quantity of biogas that has been used. The capital values are not included in the calculation. Although the components of the staff diet differ from the patient's diet for some meals, this study was unable to separate the cost of the staff diet from the cost of the patient's diet due to the lack of distinct raw material costs for the two groups.

Recommendations

It is recommended to have separate registers to enter consumables for different meals in order to calculate the cost of different meals in the future. Further, maintaining records related to capital items, like purchasing cost and date of purchase, will be very useful for calculating the capital cost in future studies. Healthcare assistants in Sri Lankan hospitals were provided with lunch and dinner from hospitals. Due to the current economic crisis and the high prices of outside foods, HCAs have made several requests to provide breakfast. Since breakfast costs only 117 rupees, it might be reasonable to provide breakfast to healthcare assistants. Based on the findings of this study, it is recommended to conduct awareness programs on cost of the dietary service among relevant authorities and minimize food waste to cut down dietary cost.

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