

Diet Cost of Inward Patient during Economic Downturn at Secondary Care Base Hospital in Sri Lanka

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Abstract: *Introduction:* Health services are provided at free of charge in Sri Lankan government hospitals which is one of the greater challenge for the sustainability to continue free health care services due to the current economic crisis. It is essential to perform cost analysis in evaluating the efficiency of providing healthcare services in the basis of free of charge. *Objective:* This study analyzes unit diet cost for inward patient in Base Hospital Akkaraipattu which is secondary care hospital and situated in South East of Ampara district in Sri Lanka. *Methods:* This is retrospective descriptive cross sectional study. Secondary data were used to calculate the unit diet cost for the month of May 2022. Step down cost accounting method and MS Excel was used to calculate the unit cost of meal. *Result:* The total cost of kitchen cost center was Rs.496, 329.02 and unit diet cost was Rs.120.98. *Conclusion:* Expenses for raw materials (Rs.929, 806.22) was higher in May 2022, as economic crisis. This study suggested conducting an awareness programme to highlight how much it costs per meal per patient to the hospital staffs.

Keywords: Diet cost, economic crisis, inward patient, health care services, hospital

1. Introduction

Sri Lanka has followed a free health policy and given free public health care for all Sri Lankans since independence. Health services are offered at no cost in public sectors while private sectors provide health services on paying basis. Currently Sri Lanka faces a greater challenge in improving nutritional status due to the economic crisis. Sri Lanka's total expenditure on health care for both public and private sectors was 3.8% of GDP which was lower than the average health expenditure of lower middle income countries (4.1%) but higher than South Asian countries' average health expenditure (3.5%) in 2021. Sri Lanka's public health expenditure was to 1.5% of GDP which was related to the average public health expenditure of lower middle income countries and was higher than South Asian countries in 2021 (1% of GDP) (14). According to the report on the public finance for financial year of 2022, the total allocation for the health sector is LKR 239, 738 million that is amounting to 1.3% of GDP. This is a reduction compared with the respective value of 2021 (15). A study documented that low income people are at high risk for specific health conditions and diseases as their financial situation, lack of education, poor nutrition and health status (9).

In health care systems, hospitals play an indispensable role in preventing diseases and maintaining the patients' health. These services are costly (16). Hospitals need more human and financial resources than other institutions to enhance its productivity and efficiency (17). However, achieving hospital productivity and efficiency during this economic downturn is very difficult in Sri Lanka. A major World Bank study revealed that 50 to 80% of public sector health resources used by hospitals in developing countries (1). Hospital dietetics unit is an essential supporting service in a hospital and supplying adequate meals for patients is a crucial part of hospital treatments for a patient's recovery. A study found that satisfactory meal supply can lead to improve and decrease length of hospital stay which have a major impact on hospital expenditure (8). Due to that, dietetic departments in many hospitals are paying more concern about patient care to improve patient satisfaction and decrease hospital cost (6). Hospital managers forced to

pay more attention on client oriented service and cost effective quality enrichment (7).

Hospital cost information is based on inputs of resource in monetary term and outputs of services. Managers need cost information to create policies and more informed decisions about how to improve the performance of a hospital and infrastructure investments, where to allocate the resources within or among hospitals, to compare the performance of different hospitals to one another and determine budgets to offer health services. Some of the fundamental reasons for requiring cost analysis are to improve efficiency, increase effectiveness, enhance sustainability, and promote quality (4). In order to enhance the quality of dietary services in hospitals, it is important to perform cost analysis which is needed to increase the client satisfaction (2). Therefore, cost analyzing is very essential that need to be performed in healthcare settings. Background picture of Base hospital Akkaraipattu is displayed in Table 1.

Table 1: Background data of Base hospital Akkaraipattu in May 2022

Characteristics	BH Akkaraipattu
Beds	313
Outpatients	6751
Total admissions	2781
Total deaths	13
Inpatient days	5788
Bed occupancy rate (2021)	55.62%
Average length of hospital stay (2021)	1.77
Number of doctors	66
Number of nurses	150
Number of supporting staffs	295
Total area of hospital	182, 678 sqft
Area of kitchen	1, 281 sqft
Number of units available	76
Number of available taps in hospital	824
Number of available taps in kitchen	05
Number of telephone extensions available in hospital	202
Number of available telephone extensions in kitchen	01

Objective

To estimate the unit cost of meal for inward patient in May 2022 at Base Hospital Akkaraipattu.

2. Methods

Study design

A retrospective descriptive cross sectional study was executed with analytical component to determine the unit cost of meal provided by hospital kitchen.

Study setting

Base hospital Akkaraipattu is a secondary care hospital which is located in South East of Ampara district. It consists 313 beds with 531 staffs.

Data Collection

Data were gathered from check list, hospital records, accounting reports, vouchers and diet records. Interviews were conducted with relevant staffs (Accountant, subject officers, Diet stewards, ward clerks).

Method of cost calculation

As an initial step, hospital’s overhead, intermediate and final cost centers were identified. Considering cost centers separately, all direct costs (e. g.: salaries, stationary, consumables) were added and sum value were calculated. The administrative cost center was apportioned according to the number of staff working in different unit and the overhead costs were apportioned appropriately to final cost centers. Step down cost accounting method and MS Excel was used to calculate the unit cost of meal.

- Overhead cost centers: cost centers which were responsible for proper functioning of intermediate and final cost centers.
- Intermediate cost centers: cost centers that were indirectly supported in the patient care delivery. There were no intermediate cost centers in this study.
- Final cost centers: cost centers which were directly involved in patient care delivery.

Cost centers in Base Hospital Akkaraipattu were shown in Table 2.

Table 2: Identified cost centers in Base Hospital Akkaraipattu

Overhead	Final
Accountant’s office	Kitchen
Establishment division	
Matron’s office	
Overseer’s office	
Water	
Electricity	
Telephone	
Cleaning	

Overhead costs

Indirect costs were appropriately apportioned and added to each cost center which is described below. Cost of water,

electricity, telephone was apportioned based on number of taps available in a unit, square feet area of unit, number of intercoms available in a unit respectively. Security and cleaning charges were apportioned according to the number of security officers and cleaning personnel.

Ethical and administrative considerations

Written authorization was obtained from research unit of planning development unit, BH Akkaraipattu. Confidentiality of the information was assured.

No conflict of interest declared.

3. Results

Salaries of staff who considered as overhead cost center were added and summed in table 3.

Table 3: Overhead salary of overhead staff in May 2022

Administrative charges	Number of staff	Salary (Rs)	Total (Rs)
Medical superintendent’s office			
Medical superintendent	1	320, 212.67	320, 212.67
Accountant’s office			
Accountant	1	167, 877.25	167, 877.25
Development officer	5	65, 430.96	327, 154.80
Management assistant	5	65, 171.13	325, 855.65
KKS	1	75, 399.69	75, 399.69
Public health unit			
Medical officer	1	220, 663.39	220, 663.39
Nursing officer	2	103, 763.78	207, 527.56
Development officer	1	65, 430.96	65, 430.96
Establishment division			
Administrative officer	1	65, 171.13	65, 171.13
Development officer	3	65, 430.96	196, 292.88
Management assistant	9	65, 171.13	586, 540.17
Matron’s office			
Matron	1	226, 860.50	226, 860.50
Overseer’s office			
Overseers	3	67, 538.96	202, 616.88
Total			2, 987, 603.53

Total salary of kitchen staffs was calculated separately which is displayed in Table 4.

Table 4: Salary of kitchen staff in May 2022

Staff category	Number of staffs	Salary (Rs)	Total salary (Rs)
Diet steward	2	60, 121.46	120, 242.91
Health service aid as cook	4	61, 551.71	246, 206.84
Total			366, 449.75

Further, apportioned security and cleaning cost to kitchen cost center were calculated and are shown in Table 5.

Table 5: Apportionment of security and cleaning cost to kitchen cost center

Category	No of staffs	Salary per person	Total salary	Apportioned staff for kitchen	Apportioned amount for kitchen
Security	35	40, 740	1, 425, 900	0.028	40, 740.00
Cleaners	60	28, 604.10	1, 716, 246	0.016	28, 604.10

Total floor area of the hospital building was 111, 317 sqft and total floor area of hospital kitchen was 1, 281 sqft which was only 1.15% of the total square feet of hospital. Therefore 1.15% of total electricity cost was apportioned to the kitchen. Cost of electricity in hospital kitchen was Rs.19, 359.87. Cost for water and telephone were allocated to kitchen cost center based on number of taps and number of intercom. Water and telephone costs to kitchen cost center were Rs.1376.21 and Rs.160.87 respectively. Security and cleaning cost were apportioned according to the number of person served Overhead administration cost to kitchen cost center was allocated from the total administration cost according to the available staffs and it was Rs.4, 093.72. There are no security officers assigned to work in the kitchen due to that salary of security officers did not include in this study while cleaning cost for kitchen cost center was Rs.28, 604.10. Stationary items weren't purchased in the month of May for kitchen cost center. Cost for consumables which were used in kitchen cost center was Rs.2453.00. Number of meals offered for patient were 7089 and 6050 meals were provided to health service assistant. Total cost of kitchen cost center was calculated by summing up all costs which is shown in Table 6 below.

Table 6: Total cost of kitchen cost center

Overhead	Cost (Rs)
Total salary of kitchen staffs	366, 449.75
Consumables	2453.00
Stationaries	3427.00
Telephone	160.87
Water	1376.21
Electricity	19, 359.87
Cleaning	28604.10
Security	40, 740.00
Administration	33, 758.22
Total	496, 329.02

Diet cost calculations

Total number of meals (staff & patients)	6050+7089	13139
Liquid paraffin gas (a)		163, 493
Cost for raw materials (b)		929, 806.22
Cost center allocation (c)		496, 329.02
Total cost	= (a) + (b) + (c)	1, 589, 628.24
Cost per meal	1, 589, 28.24/13139	120.98

4. Discussion

After the COVID 19 pandemic since 2019, currently Sri Lanka is struggling with worst economic and political disaster that lead to the country bankruptcy. Sri Lanka invested about 3.5% of GDP on health care over the year, while around 2% was contributed by Sri Lankan government and out of government budget 8% was spend on health (15). According to the National Health Accounts report in 2018 per capita health expenditure was USD 163 and government contributed to USD 73. This worsen circumstances will affect the provision of healthcare both in short and long

terms in the country. Sri Lanka has a matured health system and now the country forced to spend notably more money to maintain and develop it further.

Hospitals' efficiency is depended on bed occupancy rate, average length of hospital stays and bed turnover etc. Bed occupancy rate is indicated that beds occupied within the given period of time which is an important indicator. WHO recommended 80% or above of bed occupancy rate was considered as efficient. However, the bed occupancy rate at BH Akkaraipattu was 55.62% in 2021 could be considered as inefficient.

Dietary services are the essential supportive service in any hospital. Government hospitals in Sri Lanka, meals are provided in free of cost for patients while at a subsidized rate for health service assistants. Total number of 13139 meals (normal full diet, normal half diet and minor employees' diet) were provided during the month of May 2022 from the hospital kitchen. There is only a kitchen for both patients and staffs in BH Akkaraipattu. This study provides insight into the unit cost of meal which is provided to both patients and health service assistants in Base Hospital Akkaraipattu. Creese and Parker stated that, unit cost is the cost of providing a single good or service (5). In this study step down cost accounting method was used to calculate unit cost of meal that was relatively simple and practical approach in cost calculation of health care facilities. This study revealed that unit cost per meal was Rs.120.98 in May 2022, at BH Akkaraipattu.

The overhead salaries of overhead staffs included their basic salary, plus overtime and all additional allowances and total overhead salary in May 2022 was Rs.2, 987, 603.53. In this study telephone charge was calculated by the number of intercoms available in the units. This similar method was used in a study which was conducted in BH Eravur (10). A study was carried out in TH Kalubowila, used direct telephone lines and number of intercoms or extensions to allocate the cost of telephone to the kitchen cost center (12). Moreover, electricity cost for kitchen cost center was apportioned based on floor area in this study. This method had been used in the study conducted in BH Eravur, TH Kalubowila and India (3). In contrast, avometer was used in Ghamuria General Hospital in Alexandria to measure the electricity consumption (13). Further, cost of water was apportioned according to the number of taps available in kitchen cost center. This same procedure was used in the study conducted in BH Eravur and in other study which was carried out in TH Kalubowila, used floor area to calculate the cost of water. Cost for raw materials was RS.929, 806.22, it was much higher than other studies conducted in Sri Lanka during past years as increase in price of raw materials and exchange rate of currency. According to the diet circular which was issued by Ministry of Health and Indigenous Medicine in 2015, there are different types of diets offered by hospital kitchen. 102 high protein diet, 1671

diabetic patients' diet, 201 liquid diet, and 258 special diet were provided in May 2022 by our hospital kitchen.

5. Conclusion and Limitations

As revealed in this study, unit cost of meal which is provided in Base Hospital Akkaraipattu is Rs.120.98. Similar studies conducted in Teaching Hospital Kalubowila in February 2014 and Base Hospital Eravur in December 2020, and their unit cost of meal was Rs.119 and Rs.127.15 respectively. Even though the cost of raw materials was high as mentioned above, the unit diet cost was nearly same when compare Teaching Hospital Kalubowila and Base Hospital Eravur due to much supply of meals. Some overhead cost centers such as quality control unit, infection control unit, health education unit also transport cost, postal cost, maintenance cost, expenses for staff quarters, training cost, salary of health service assistants who are working in overhead cost centers were not included in this study as it causes more complexity in cost calculation. There were minimum records available on lands, buildings, major equipment as the capital cost of such items were not included in unit cost calculations. Quantities of normal full diet, normal half diets and minor employees' diets were considered to calculate the unit diet cost, but quantities of other types of diets weren't included in this study.

6. Recommendations

This study proposes to conduct an awareness programme to highlight how much it costs per meal per patient to the hospital staffs and advices to maintain proper documents regarding equipment and instruments.

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