COST MANAGEMENT PRACTICES OF HEALTHCARE SECTOR IN KERALA

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DOCTOR OF PHILOSOPHY IN COMMERCE

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DECLARATION

I, **Hafeefa Cholasseri**, do hereby declare that this thesis entitled **"COST MANAGEMENT PRACTICES OF HEALTHCARE SECTOR IN KERALA"** is a bonafide record of research work done by me under the guidance of **Dr. K.P. Muraleedharan**, Professor (Rtd.), Department of Commerce and Management Studies, University of Calicut. I further declare that this thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title of recognition.

C .U. Campus, **Hafeefa Cholasseri**

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Certificate

This is to certify that the thesis entitled **"COST MANAGEMENT PRACTICES OF HEALTHCARE SECTOR IN KERALA"** is a bonafide record of research work carried out by **HAFEEFA CHOLASSERI** under my supervision and guidance for the award of Ph.D Degree of the University of Calicut and no part of the thesis has been presented before the award of any degree, diploma, or other similar title or recognition.

She is permitted to submit the thesis.

Dr. K.P Muraleedharan
Doctoral Guide

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ABBREVIATIONS

ABC	Activity Based Costing
AB-LCC	Activity Based Life Cycle Costing
ABM	Activity Based Management
ANOVA	Analysis of Variance
BSC	Balance Score Card
CAS	Cost Accounting Standard
CASB	Cost Accounting Standards Board
COMPASS	Cost Control Strategy and Planning Methodology
CQI	Continuous Quality Improvement
DSS	Decision Support System
EDI	Electronic Data Interchange
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
GNI	Gross National Income
HDI	Human Development Index
HSD	Honestly Significant Difference
ICAI	Institute of Cost Accountants of India
IMS	Intercontinental Medical Statistics
IP	In Patient
IT	Information Technology
LCC	Life Cycle Costing
NRI	Non Resident Indian

OLAP	Online Analytic Program
OP	Out Patient
OT	Operation Theatre
PC	Personal Computer
PPP	Purchasing Power Parity
RBV	Resource-Based View
SME	Small and Medium Enterprises
SPSS	Statistical Packages for Social Sciences
TDABC	Time Driven Activity Based Costing
TOC	Theory of Constraints
TOR	Turnover Rate
TQM	Total Quality Management
UNDP	United Nations Development Program
UVA	Value Added Unit
WHO	World Health Organisation

Dedicated

To My Father

for his dream of his daughters being self-reliant

and

for the liberty enjoyed during this journey…

Chapter I

INTRODUCTION

This life is a hospital in which every patient is possessed with a desire to change his bed.

– Charles Baudelaire

1.1 PREFACE

Today, health care is enrolled in a fascinating market of innovation. The value for physician has been replaced by the value for services in terms of quality, technology, facility and the price charged. Fulfilling patients' customized needs have become the motto of the hospital sector. A drastic change in the concepts of healthcare has been placed by commercialization.

Man's desire is rich with unfulfilled need and the epitome of ambitious thoughts. His/her every need is redefined with the introduction of commercialization. The basic need locates its position through the new trends in commercialization. Maslow in his need hierarchy theory has very well interpreted the needs of man and value each proposes. According to Maslow, there are general types of need (physiological, safety, love, esteem and self – actualization) that must be satisfied before a person can act unselfishly. He called these needs 'deficiency needs'. On the whole an individual cannot satisfy any level of need unless physiological and safety needs are satisfied. There is no generally accepted definition for need.

An overwhelming thought that exists in todays' society is the priority in 'need'. Survival needs outreach the existence of an individual. Similarly, safety needs narrow alongside survival needs. Safety needs include health, a major task for sustaining in an ecological cycle. In the current scenario, to be healthy explains not only the physical and mental being but also the backdrops to sustain it. Health is perhaps one of the most difficult healthcare term being defined. WHO defined health as a state of complete physical, psychological, social and spiritual well – being and not merely the absence of disease and infirmity (WHO, 1999)[1].

The Language of Healthcare

Healthcare needs are often measured in terms of demand, but demand is to a great extent 'supply – induced'. For example, variations in general practice referral or consultation rates have less to do with status of the populations served than with differences between doctors, such as their skills or referral thresholds. Last notion of the 'clinical iceberg' of disease has been supported by various community studies indicating much illness is unknown to health professionals. It is this situation that allows the physician a great deal of control over utilization by allowing the supplier of services to determine the demand.

In fact, it was estimated that during the mid – 1980s individual physicians' accounted for 80% of the nation's healthcare

expenditure (although less than 25% goes for physician services) due to their gate keeper function. (Eisenberg, 1986)[2].

Healthcare Vs. Disease Care

The patient outcomes are exercised through the outcome achieved per rupee expended. It is not the different services provided or the volume of services delivered that matters but the true status of health. The hospital usually feels difficult to allocate the cost of stand by facilities such as generator, back up operation theatre and extra trained staff. They charge these cost to each patient which overloads the price. Use of sophisticated technology and equipment by the doctors and hospitals, are further termed as quality and keeps a better mileage for the hospital. The core services are often blanketed with these sophistications which blindfolds the consumers' needs. Hospitals today focus on disease care by summing up the circumstances with medicinal ails, curative and preventative care have been shifted to the unaddressed corners of the hospital. Recent trends that venture into this sphere has proved that treatment for various disease are more of concern than recreating the health of a person. Much of the dimensions drive force towards treatment of diseases than on the wider concept of healthcare.

The meaning of healthcare has been transformed into the mere curing of the disease and not taking a deeper step for better health and preventive care. A spectacular view on

commercialization has explored marketing strategies for the disease care in a hospital. Healthcare has therefore been redefined by the verges of commercial entities.

Medical Service Review: An Vow to the Human Kind

The iron triangle of healthcare i.e. cost, quality and access highly demonstrate its sensitivity. The historically dominant model in US society is referred to as the medical model. The medical model had its genesis in the establishment of germ theory as the basis for modern scientific medicine. This perspective emphasizes the existence of clearly identifiable clinical symptoms, reflecting the conviction that illness represents the existence of biological pathology. Thus, illness is a state involving the presence of distinct symptoms, health is the negative residual condition reflecting an absence of symptoms. Illness is a broad term which explains the poor state of mind and body on the other hand, health a positive term of being free from all illness. The connectivity apparent to illness and health often secludes towards the consultation with a physician. The rise in trust and delicacy of the situation brings up the necessity of a physician for healthcare. The price charged for his services were merely on the level of satisfaction rendered through the services. But, the independent evolution of fee schedule for various procedures has resulted in some notable imbalances in fees. This means that when objective criteria are applied, some procedures are identified as overpriced others as underpriced. A new way of looking into the market was necessary,

and this involved transforming health services into products and patients into consumers. Market hegemony was created on the whole. From a medical perspective, the focus is on the formal utilization of health services. Physician units, hospitals admissions, outpatient procedures and drug prescriptions are typically used as indicators of the volume and types of health behavior.

In the South East Asia region, at least 65 million people are impoverished because of out-of-pocket health spending, much of which is on medicines, while others forego treatment because of the cost. Medicines are only “accessible” if they are paid for in such a way that they actually reach the people who need them. (WHO, 2017)[3].

Price Sensitivity in Hospital Service

An affordable care is always a dream cause for any consumer in healthcare sector. Healthcare market is highly competitive in the current scenario and therefore sustainability for the hospitals and medical choices for the consumers are the bottlenecks. Consumers have greater understanding of the various health facilities in the market and they often encounter with various substitutes in parallel to the price and quality. The situation resulted into a higher responsiveness of the consumers towards availing the healthcare services. A slight change in price brought the consumers to rethink of the substitutes available and sensitiveness in choosing various medical services.

Cost Management

In the last decade, many non-profit and hospital organizations started to face difficulties in balancing limited resources and costs to provide their demand for services. Due to the introduction of modern medical techniques and medicines and consequent increase of consumed costs, many hospitals are under pressure to adopt more advanced cost management techniques usually utilized only in profit organization sector. Hospital managers frequently seek the advanced techniques, for better understanding of relations between the cost and provided services. The intensity in competition and the restlessness on technology modernization carried in the significance of cost management in this industry. Cost has become an extremely strong competitive tool. One of the key factors of effective company management is ability of accurate estimation of the cost of services. Service costing is an essential economic tool used to quantify the cost of interventions carried out.

Hospitals were induced to be cost consciousness as an impact of the competitive market. Charging prices for various services induced cost consciousness to a greater extent. Cost for the value of the services turned to be the motto of the industry. The goal for the sector was tuned as value maximization upholding the worth of cost sacrificed. The need for an accurate method of costing in hospital organizations is frequently emphasized by many authors. Gujral et al. (2010)[4] comments, that healthcare

organizations use cost accounting to estimate the unit cost of services they provide. Koyama (2000)[5] states, that the importance of accurate estimates of costs for medical services is increasingly recognized by hospital managers. Ridderstolpe et al. (2002)[6] state, that a valid basis for calculation is increasingly important in the cost control of health care against a background of increasing demands and resource constraints.

Conventional cost management techniques, well known as cost smoothing has undergone tremendous critical evaluation in this era of scientific and technological existence. A costing approach that broadly assigns the average (spreading) of the cost of resources uniformly to cost objects (such as products or services) when the individual product number crunching or services, in fact those resources are in no uniform way. Direct and indirect costs attributed to healthcare represent a significant and increasing burden on the economies of countries providing modern healthcare, and may not be sustainable at current growth rates. Flieschman and Parker (1991)[7] evidence for a relatively mature cost management has been found in four major areas of activity: cost control techniques, accounting for overhead, costing for routine and special decision making, standard costing in 1980's.

Cost Structure in Healthcare Sector

Modern technology in healthcare sector and consequent changes in cost structure is another important issue which is discussed with regards to costing method. Traditional costing methods have caused distortions in indirect costs and accounting reports normally do not provide the managers' interpretations and actions for the control of deviations related to specific problems. The difficulty inherent in choosing a proper and accurate costing method outlay various scenarios of managerial decisions. The important limitation of traditional (absorption) costing methods had been also deeply discussed along with advantages of other costing techniques as Activity-Based Costing (ABC).

Healthcare costs are continuously spiraling up and hospitals are facing a steep competition to provide increased aim to high quality services. The industry has ferociously grown to a wider spectrum in concern with technology and technicalities which has lead in initializing the mushrooming of hospitals. Over the years, the revenue lines have been increased and cost dimensions have entered into a scenario building an in-depth competitive market. As brought forward earlier in this chapter, cost management has become a strong tool to sustain in the market, reflecting cost consciousness at its know-how.

Activity Based Costing

In a highly competitive environment, business struggle under the cost pressure and therefore the profit margin squeezes. As a result of this intense competition, the business must effectively manage cost and competitively price the products and services. Therefore, both cost measurement and its management methods are becoming more important in the aspects of pricing and overall marketing decisions.

Johnson and Kaplan (1987)[8] states that the traditional costing methods cause miscalculations in the product pricing by giving importance to production volume than to its activities. Introduction of an activity based costing method tallies filling such gaps and moreover, preventing incorrect costing and pricing mechanism. ABC identifies firstly, the major activities creating overhead costs, then it groups activities having the same cost drivers into cost pools, and finally it assigns total overhead costs to each product or service by formulating each cost pool's absorption rate.

Aldukhil (2012)[9] mentions that Robert Kaplan issued a challenge to 'derive new internal accounting systems that will be supportive of the firm's new manufacturing strategy'. The success factors that leads ABC include process cost improvement, non-process cost improvement, revenue improvement and consumer

satisfaction. ABC increases management visibility into how service consumes work and resources.

Key Elements of ABC

The key elements of ABC costing are given in table 1.1 below:

Table 1.1: *List of Key Elements*

ELEMENTS	DESCRIPTION
Resources	Economic elements used to perform activities, such as management costs, facilities, support, etc.
Activity	Processes or procedures used to do work
Activity Center	A cluster of related activities
Resource Drivers	Factors used to allocate resources or pools of costs to activities
Activity Cost Pool	The total cost assigned to an activity
Activity Driver	A factor used to assign cost from an activity center to other activity cost pools or cost objects.
Cost Element	The amount paid for a resource assigned to an activity
Cost Object	The ultimate goal for performing an activity; in ABC, it represents the final cost assigned to a product or service

Source: Compton, T. R. (1996)[10].

Pavlatos and Paggois (2009)[11] explains that often ABC is driven by the need to improve consumer profitability analysis, gain

accurate information on cost for pricing, to prepare relevant budgets. Application of ABC involves:

- Service planning
- Consumer profitability analysis
- Service –mix
- Performance evaluation
- Budgeting
- Cost reduction
- Cost Modeling
- Output
- Service design.

Activities form a crux to evaluate over the functioning. Each activity is analyzed to find the economic break even points. Eventually optimize the business operations as per cost creation. Developing an activity based costing system entails three steps:

1. Identifying resource costs and activities
2. Assigning resource costs to activities
3. Assigning activity costs to cost objects

An explanation of these aspects are discussed in the chapters ahead.

Healthcare – Indian Scenario

Indian healthcare system is in a broken down state. Rise in the cost of medical care among private hospitals is the situation which crumbles and no control of government on these hospitals is visible. Although healthcare real costs looks affordable but the health care price is, almost prohibitive to the average Indian citizen.

The Constitution of India makes health in India the responsibility of state governments, rather than the central federal government. It makes every state responsible for "raising the level of nutrition and the standard of living of its people and the improvement of public health indices as among its primary duties". There are great inequalities in health between states.

Hospitals today are places where medical treatment is provided, but also places where major life events, such as birth and death, occur. Yet, their history is relatively short; they were born, together with modern medicine, some two hundred fifty years ago at Paris. Around 1790, large hospitals and pioneering research blossomed throughout Europe, replacing the Hippocratic model of disease with the localizations paradigm. The rise of the modern hospital began in Paris when the social change brought about by the French Revolution provided the momentum for the transformation. For the first time in history, cure of the body and care for the soul were separated, and physicians, rather than the church and rich lay patrons, took charge of medical institutions.

Medical treatment was no longer a privilege of the rich (at home) or charity for the poor (in hospital), but an indispensable human right. The first hospitals were founded when Christianity became the state religion of the Roman Empire. World's first private integrated group practice was initiated by Dr. William Worrall Mayo. Patients discovered advantages to a pooled resource of knowledge and skills among doctors. Mayo Clinics changed the medical history stating that the ultimate success of the Clinic, past, present and future, must be measured by its contributions to the good of mankind.

Hospitals guarded the social order and enabled uninterrupted running of commerce and manufacture in cities. Considered as institutions of social prevention, they simultaneously protected marginal social strata from homelessness and hunger, and the society from the marginal social layers. They brought under the same roof all those who could not afford better accommodation – abandoned children, travelers, the sick, and the poor. In contrast to monastic institutions, they employed university-educated medical practitioners. This was the period when early-medieval type of religiousness, marked by asceticism, withdrawal from the worldly life, and contemplation, was replaced by the late-medieval "secular" type, which emphasized the need to act socially and charitably. Thus, the number of hospitals were often higher than what the population size required.

Modern hospital was thus born with the secular state and medical reform in the French revolution. The norms and values of the new revolutionary society were built into the foundations of this institution and in modern medicine. This short overview of the history of the "pre-modern hospital," which appeared with Christianity in the late antiquity, showed that many questions we grapple up today had also been tackled by our medieval ancestors. Different models coexisted at the same time in towns only a few hundred kilometers apart, but under very different regimes and economic circumstances, reminding us how deeply the history of medicine/medical treatment is embedded in social history.

Indian Medical System and International Sector

With the establishment of the Portuguese East India Company in Goa (1628–1633), a meager change was visible with the gathering of valuable materials from the local physicians. For the rest of the 17th Century, there was free exchange of ideas between the Indians and the Portuguese on medical treatment. The Dutch East India Company was also very much interested in the traditional medicines of India and showed a great deal of regard for the local flora and fauna of the Malabar Coast. Then, the British arrived in India to pursue trade which was followed by the establishment of the British East India Company, informally known as John Company. Like the Dutch and the Portuguese, the British rulers also faced the same difficulty, i.e., affected by new set of diseases in India. Naturally, they resorted to learning the art of oriental medical treatment from the native practitioners. In turn,

native practitioners were highly interested in learning the surgical methods from the British as they were not accustomed to such methods. Later, we find that the attitude of the British towards the traditional medicine changed. With the introduction of Lord Bentinck's educational reforms in 1935, support for Ayurvedic training and teaching of oriental medicine in state-funded colleges ceased though the oriental practitioners continued to practice. As early as the 1860s, people of Bengal had forced the Medical Department of the Bengal Presidency to introduce a new policy, to prescribe traditional Indian medicine. During the Indian independence movement (especially during the Swadeshi and Boycott Movement), traditional medicines received inviolable support from the Indian masses, especially from the nationalists. Since India got independence in 1947, the government has shown interest in the development of both cosmopolitan and traditional medicines.

The totality in health spending accounted India's expenditure on the health sector has risen from 1.2 per cent of the GDP in 2013-14 to 1.4 per cent in 2017-18. The country has set public health spending to 2.5 per cent of its gross domestic product (GDP) by 2025.

The index based on human development approach, developed by Amartya Sen, frames about desirable things in life. It includes being well fed, sheltered, healthy and other commonalities. The **Human Development Index** (**HDI**) is a statistic composite index of life expectancy, education, and per capita income indicators, which are used to rank countries into four

tiers of human development. A country scores a higher HDI when the lifespan is higher, the education level is higher, and the gross national income GNI (PPP) per capita is higher. It was used to measure a country's development by the United Nations Development Program (UNDP).

Human Development Index of Indian states since 1995 showcase a precise point where the states are scattered in a HDI.

Table 1.2: *HDI*

Rank	**State**	**HDI 1995**	**HDI 2000**	**HDI 2005**	**HDI 2010**	**HDI 2015**	**HDI 2018**
1	**Kerala**	**0.562**	**0.610**	**0.694**	**0.732**	**0.770**	**0.784**
UT1	Chandigarh	0.607	0.642	0.670	0.658	0.739	0.774
2	Goa	0.579	0.623	0.684	0.751	0.763	0.764
UT2	Lakshadweep	0.669	0.711	0.739	0.729	0.738	0.749
UT3	Delhi	0.630	0.673	0.700	0.718	0.734	0.744
UT4	Andaman and Nicobar Islands	0.663	0.704	0.732	0.722	0.731	0.742
UT5	Puducherry	0.694	0.738	0.767	0.756	0.737	0.739
3	Punjab	0.547	0.582	0.620	0.664	0.706	0.721
4	Himachal Pradesh	0.557	0.596	0.653	0.675	0.706	0.720
5	Sikkim	0.515	0.549	0.598	0.643	0.696	0.716
6	Tamil Nadu	0.507	0.546	0.605	0.655	0.694	0.708
UT6	Daman and Diu	0.628	0.669	0.695	0.686	0.695	0.706
7	Haryana	0.515	0.550	0.594	0.639	0.687	0.704
8	Mizoram	0.532	0.574	0.637	0.694	0.697	0.697
9	Maharashtra	0.523	0.561	0.607	0.651	0.683	0.695
10	Manipur	0.525	0.563	0.603	0.691	0.699	0.695

Rank	State	HDI 1995	HDI 2000	HDI 2005	HDI 2010	HDI 2015	HDI 2018
11	Jammu and Kashmir	0.493	0.530	0.591	0.646	0.675	0.684
12	Karnataka	0.481	0.517	0.567	0.610	0.662	0.682
13	Uttarakhand	0.594	0.627	0.655	0.643	0.662	0.677
14	Nagaland	0.491	0.524	0.558	0.666	0.681	0.676
15	Gujarat	0.489	0.526	0.573	0.608	0.651	0.667
16	Telangana	0.593	0.628	0.655	0.643	0.651	0.664
UT7	Dadra and Nagar Haveli	0.645	0.686	0.714	0.704	0.665	0.661
17	Arunachal Pradesh	0.471	0.501	0.531	0.639	0.661	0.658
18	Tripura	0.499	0.532	0.561	0.613	0.645	0.655
19	Meghalaya	0.435	0.470	0.531	0.621	0.648	0.650
20	Andhra Pradesh	0.443	0.476	0.529	0.581	0.627	0.643
21	West Bengal	0.474	0.506	0.540	0.576	0.620	0.637
22	Rajasthan	0.432	0.462	0.505	0.547	0.601	0.621
23	Assam	0.453	0.486	0.527	0.565	0.593	0.605
24	Chhattisgarh	0.525	0.555	0.581	0.570	0.586	0.600
25	Odisha	0.422	0.452	0.489	0.533	0.580	0.597
26	Madhya Pradesh	0.419	0.450	0.493	0.533	0.577	0.594
27	Jharkhand	0.557	0.557	0.583	0.572	0.578	0.589
28	Uttar Pradesh	0.423	0.454	0.496	0.529	0.566	0.583
29	Bihar	0.401	0.430	0.464	0.511	0.551	0.566
	India	**0.460**	**0.493**	**0.536**	**0.581**	**0.624**	**0.640**

Source: UNDP, 2018

Public Vs. Private Sector in Healthcare

According to National Family Health Survey-3 (2015 -16), the private medical sector remains the primary source of health care for 70% of households in urban areas and 63% of households in rural areas. Reliance on public and private health care sector varies significantly between states. Several reasons are cited for relying on private rather than public sector; the main reason at the national level is poor quality of care in the public sector, with more than 57% of households pointing to this as the reason for their preference for private health care. Most of the public healthcare caters to the rural areas; and the poor quality arises from the reluctance of experienced health care providers to visit the rural areas. Other major reasons are distance of the public sector facility, long wait times, and inconvenient hours of operation. The study conducted by IMS Institute for Healthcare Informatics in 2013, across 12 states in over 14,000 households indicated a steady increase in the usage of private healthcare facilities over the last 25 years for both Out Patient and In Patient services, across rural and urban areas.

With the help of numerous government subsidies in 1980s the private health providers entered the market to cater to the middle class which was disillusioned with the public health sector and sort to exit it wherever possible. Also opening up of the market in the 90’s further gave impetus to the development of the private

health sector in India. 80% of new beds built between 2005 and 2015 are in for-profit hospitals.

Kerala Model of Healthcare

In Kerala, the Healthcare Sector has a sophisticated role which is quite liberal to the science of management. The service pricing and its outlook are yet an oath of the traditional translation and is least viable to the trendy costing culture. With the best qualified professionals in each and every field, allopathic, dental, Ayurveda etc. which is indeed renowned over the world. The competent medical facilities and doctors are the charm which Kerala has always shared around. Services, the so called treatment is an over thought for the world class medical facility. Even the cause and its effect over medical facility have been dominated by the manpower and the enlarged technology. The strategically medical ailment and the thorough processing of technology along with up gradation is an arm to the means of pricing the service.

The Kerala Model of Health is often known as “good health based on social justice and equity”. Cost has been characterized under this model which initially popularizes it through the quality rendered. Social equality is one among the hall marks of Kerala model.The rule of the market and the traditional approaches still conquer the kingdom of healthcare. Transparency in cost management needs to be questionable in the current healthcare costing structure. Among the most under polished procedures cost

management has also placed its position in large. Both the private sector and public sector need an esteem evaluation in the services provided thereon.

Hospitals whether valued as specialty or super-specialty or multi-specialty or the general hospitals need to idealize the cost pertained on the value of their services. Category does not rename their cost valuation rather the transparency can be synchronized with a good set of factors. Identifying and evaluating these major and minor elements of cost is highly volatile with the manpower and technology that is established.

Kerala's development experience has been distinguished by the primacy of the social sectors. Traditionally, education and health accounted for the greatest shares of the state government's expenditure. Health sector spending continued to grow even after 1980 when generally the fiscal deficit in the state budget was growing and government was looking for ways to control expenditure. But growth in the number of beds and institutions in the public sector had slowed down by the mid-1980s.

Growth of Private Healthcare Sector

From 1986–1996, growth in the private sector surpassed that in the public sector by a wide margin. Public sector spending reveals that in recent years, expansion has been limited to revenue expenditure rather than capital, and salaries at the cost of supplies. Many developments outside health, such as growing literacy,

increasing household incomes and population ageing (leading to increased numbers of people with chronic afflictions), probably fuelled the demand for health care already created by the increased access to health facilities. Since the government institutions could not grow in number and quality at a rate that would have satisfied this demand, health sector development in Kerala after the mid–1980s has been dominated by the private sector. Expansion in private facilities in health has been closely linked to developments in the government health sector. Public institutions play by far the dominant role in training personnel. They have also sensitized people to the need for timely health interventions and thus helped to create demand. At this point in time, the government must take the lead in quality maintenance and setting of standards. Current legislation, which has brought government health institutions under local government control, can perhaps facilitate this change by helping to improve standards in public institutions.

For Kerala, the health sector is the backbone of economic and social prosperity. Kerala's health sector would focus on twin goals of health care promotion, namely "health for all" and "health hubs". The medical establishment Bill, 2013 portrays the importance of state private hospitals, laboratories, diagnostic centers in the medical care. Currently private sector accounts for more than 70% of all facilities and 60% of all beds. The types of ownership range from corporate to single ownership. The sophistication in hospitals from single doctor to multi-specialty

hospitals have become the preferred providers for the affluent and middle class. The number of private healthcare institutions has swelled in the arena of super-specialty and multi-specialty during the last decade. Kerala being charmed by the best professionals is also drained by the cost that consumes the professionals; the anarchy of cost elements is highly subjected in these services.

Time also pursue the healthcare sector to a greater extent. Lifestyle has accustomed various diseases alongside the busy operations in life. To extent this perspective of society, lesser importance to health and much importance to current issue named under disease is concentrated. A change from healthcare to disease care has prospectively led to institutionalizing and specializing the health. The demand for increased disease care has cropped hospitals into the sphere.

Quite often it is much observed that this mushrooming of hospitals have lead to an enormous competitive market. The tremendous trend was led by the demand and the quick shot of commercialization. Corporate culture has proved its demand in the healthcare sector. Providing high end technology and better facilitated non – core services have become part and parcel of the competitive market. Various facilities that portray the lifestyle of the society has been enlarged to attract the common man. Facilities of a global scenario have been pushed to the market following the medium of healthcare. Technical and technological changes in this sector are much subjective to the demand brought forward.

Corporatization has indeed promoted packaged pricing for various healthcare services. Various promotions that categorize commercialization can be observed in this sector. Quality Accreditation is another valuing process among hospitals as part of its advancement.

1.2 SIGNIFICANCE OF THE STUDY

Kerala's healthcare sector has become a demanded market bringing out phases of corporate culture and an undiscussed commercialization. Today, people choose their required medical service and their higher awareness in medical facilities is one such character. Technological advancement has indeed led a boom in the technicalities of this sector. Hospitals compete proving their edges in facilities and creating a sound quality medical service.

The presence of multiple systems and providers of care, the absence of a proper referral system in place and the existence of a huge unregulated private healthcare sector need to be addressed adequately before embarking on a provider payment mechanism. In addition, International exposure, NRIs', IT boom all lead to the shift in healthcare demand. Theoretically, an unregulated private health care is bound to result in market competition in terms of price and quality. High quality of care is often equated with access to the newest technology, the most advanced medications and facilities, poised at the cutting edge of clinical care and research.

In the current scenario, trend towards increased automation

reduced human labour have replaced direct cost to indirect cost. ABC is related with improvement in cyclical time and quality. Nowadays, global competition forced manufacturing services and organization to become more flexible, integrated and highly automated in order to increase their productivity at reduced rate. But it is impossible to sustain competition without an accurate cost calculation mechanism.

Through the realm and roads, cost and its era have occupied a pivotal place in the managerial science of a firm. The fascinating importance of cost management can be termed as an eye opener among the business magnets. In simple terms, cost may be described as a total of all expenses incurred, whether paid or not. The cause of change has immensely portrayed a wealthy outlook across the business world. Performances over evaluation have challenged the ethics of Business Accounting to an entry of extended satisfaction. The major components of cost likewise material, labour and overhead have shifted its importance over the period.

Being an aid to management, arrangement of cost data is a tool for guidance. Surviving over the surplus cost is often riskier for a heavy growth .This paves the role of cost management in the Healthcare. As cost management is simply not cost finding rather it is a device for cost control and reduction, high potential can be marked in a diagnosed analysis of the cost structure. Geographical distance is no more a space of design, affecting high opportunities

provided by the global competition. Improved transportation and communication in conjunction with high quality technological operations carry higher prices which have urged the increase in cost management.

But, looking through costing terminologies, indirect cost certainly has increased overtime and its management is unsophisticated. Mere apportionment of cost does not prove scientific and require an activity wise analysis to absorb this cost. The study here reaches to this gap of understanding hospital cost structure, moreover, the overhead cost impulsion and the awareness of Activity Based Costing technique in its allocation.

1.3 STATEMENT OF THE PROBLEM

Had it been technological innovativeness or the facilities furnished, healthcare sector has entered into a competitive arena were healthcare services require strategic improvement. Hospitals were the considerate of medical services through quality definitions. Over the years, medical science had been the essence of healthcare services. Physicians played a vital role in diagnosing various ailments. Labour cost and material cost were the threshold cost of healthcare services.

Recent trends highlight the texture of healthcare services as a medium through the advancement in technology. Facilities have been attached to the core services of a hospital. A drastic change in the purview of healthcare sector can be seen. The industry further

led to a competitive market, nurturing commercialization. This scenario further created the edges of competitive market. The structure of healthcare culture has been tamed more towards commercial aspects. Technology powered the value of consumer denomination to levels of income and lifestyle. Healthcare generally termed and categorized for its uniqueness is clouded with riskiness and rigorous crucial aspects.

Cost has become the competitive strategy to sustain in the market. The changing lifestyle and dynamics of life has sophisticated the relevance of cost in healthcare management. Today, consumers go for value for money. Value which is conceptualized as benefit through cost of getting the benefit at the price paid. Moreover, labour cost is punched by influence of high technology – overheard cost. The total amount of overhead costs base increased in significance over time.

At the same time, many overhead activities are unrelated to the units served. The Overhead activities are consumed by services in different proportions than are unit - based Overhead activities. Activities form a crux to evaluate over the functioning. Each activity is analyzed to find the economic break even points. Eventually optimize the business operations as per cost creation. A positive energy from the mismatch of expenses can be led by better management. The need for rigorous cost management is clear.

1.4 RESEARCH QUESTIONS

Based on the statement of the problem discussed the researcher has set the following research questions.

1. Are patients' price sensitive towards availing services from Modern Science hospitals?

2. What is the prevailing cost structure among the different classes of hospitals?

3. Has there been any cost management practiced by the hospitals?

4. Are the hospitals aware about the scientific allocation of overhead cost to each consumer?

5. Does the hospital performance indicators improve when there is better cost management and cost structure followed by the hospital?

6. Is there any variation in the study variable based on hospital profile?

1.5 OBJECTIVES

Based on the above research questions, the following objectives have been set for the study.

1. To examine the patients' price sensitivity towards Modern Science Hospitals' services in Kerala and its variation based on the sample profile.

2. To analyze the prevailing cost structure of hospital services and its variations.

3. To study the prevailing cost management practices followed by hospitals in Kerala and its variations.

4. To examine the awareness, interest and implementation of ABC in hospitals of Kerala and its variations.

5. To study the empirical relationship between cost management practices and the performance indicators of the hospital.

1.6 SCOPE OF THE STUDY

Kerala model of healthcare is always a discussed form of service. The research is on cost management practices in the healthcare sector of Kerala. The study has focused on private hospitals of Kerala, in particular to Modern Science hospitals. Both General and Multi – specialty hospital form part of the study. Super specialty hospitals are considered as multi-specialty hospitals in the study.

For the further objective of the study, to examine the sensitivity among the patients towards healthcare services, 450 patients have been framed for the study.

1.7 HYPOTHESES OF THE STUDY

Based on the objectives mentioned the following hypotheses have been formulated and tested.

Hypothesis 1

Patients' price sensitivity towards Modern Science hospital services in Kerala is independent of profile variables.

Hypothesis 2

The cost structure of hospital services of Kerala is independent of profile variables.

Hypothesis 3

The cost management practices of hospitals are independent of profile variables.

Hypothesis 4

The awareness, interest and implementation of ABC in hospitals of Kerala are independent of profile variables.

Hypothesis 5

The performance indicators of the hospital are independent with regard to the cost management practices.

1.8 POTENTIAL CONTRIBUTION OF THE RESEARCH

The present study aimed to validate the existing concepts of Cost Management and Activity Based Costing technique and contribute for better appropriation of cost to various cost centres and cost units so as to increase the value of the consumers. A better understanding of hospital cost structure has also been visualized through this research.

1.9 CONCEPTUAL FRAMEWORK

Based on literature review, concepts that are important predictors of cost management were identified. From the observations made about the concepts, the conceptual framework was developed as shown in Figure 1.1. The variables for the study include the elements of cost on the basis of nature as per CAS – 1 i.e. material, labour and overhead. Furthermore, cost management practices were evaluated using cost planning, cost control and cost reduction techniques. Value Analysis and engineering, benchmarking, responsibility centre, outsourcing etc. are examined as part of Cost control and Cost reduction techniques. Patient's price sensitivity alongside institutional cost consciousness is also part of the study. Explanation of this sensitivity ultimately results in the technique of Activity Based Costing. The hospital performance is summed up through the relationship between cost management and performance indicators.

A translation of the concept developed in the study can be widely diagrammatized through the figure. An aerial view of the different objectives and their relation through variables form part of the diagram. The framework broadens the scope of various concepts used in the study.

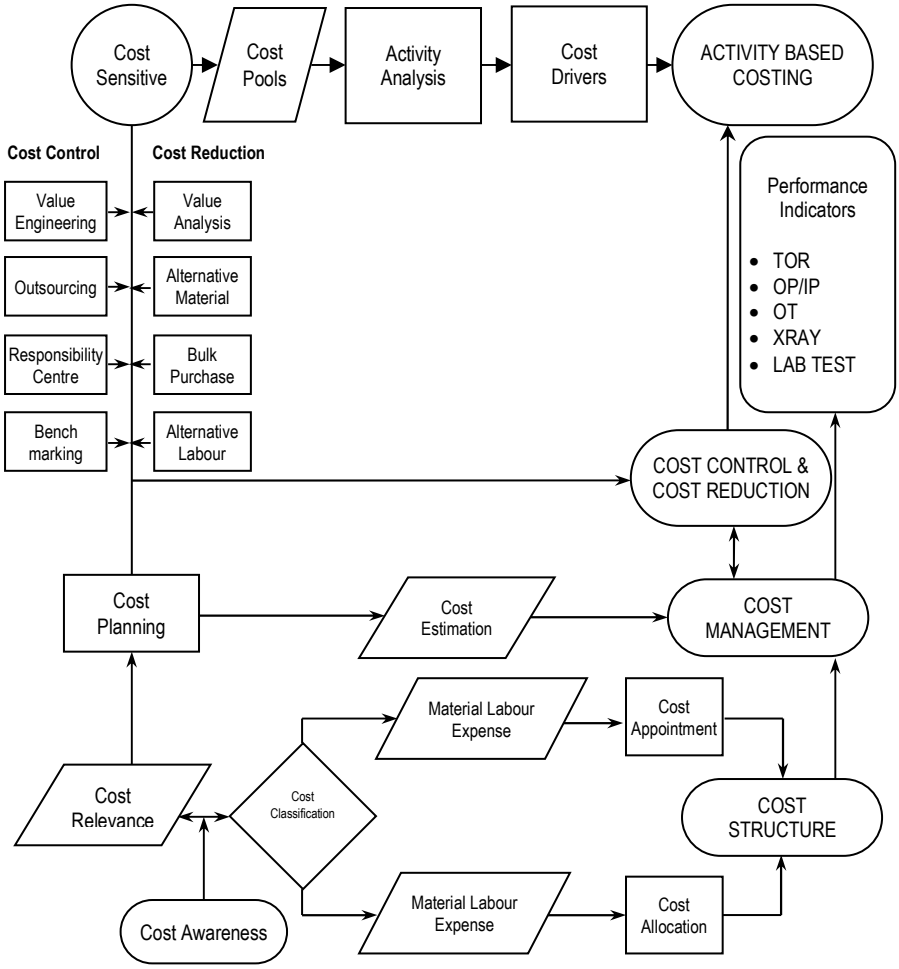


Fig. 1.1: Conceptual Framework

1.9.1 Elements of Cost

1. Material cost: Cost of consumables and medicines utilized to render the service. It involves tourniquet, dry Cotton, Spirit Swab, Vaccutainer, Syringe, Isopropyl alcohol, Tubes, Glucometre, Bandage, Stool bottle/Sputum bottle, Glucose strips, Suture material etc.

2. Labour cost: Cost for physician, paramedical and other staff services in the hospital. Labour Cost has been classified as doctors cost and other staff cost. Doctors cost are the cost expended for attaining the services of the physicians. And the other staff cost are the cost expended for attaining the services of staffs other than physicians in a hospital.

3. Overhead Cost: Cost incurred by the entire organization and not directly related to the volume, for example electricity, water etc. It has been further classified has technology cost and quality cost. Technological cost is the total cost for the technology used and quality cost is the cost for maintaining the quality of the healthcare service.

1.9.2 Cost Control

An execution action to eradicate activities which do not value the services and increase the cost as a whole.

1. Value Engineering: A technique designed to examine the cost of a service and to determine whether elimination is

possible keeping all other aspects including functions, quality and performance in a sustainable manner.

2. Responsibility Centre: Subunits of an organization for which authority and responsibility is sorted. Revenue and cost information are reported on the basis of responsibility allocated to these centres.

   a) Cost Centre - The unit may be a product, a service, division, department, section, a group of plan and machinery, a group of employees or a combination of several units.

   b) Profit Centre - A profit centre is a business unit or segment that generates revenues and incurs costs.

3. Outsourcing: It is One-way that helps take employees on third party roles especially when it is for one time projects. This saves the employer from taking the cost onto his books. This is definitely done keeping in mind that the outsourcing partners are of the standards that do not hamper the quality of services to the consumers of the business. Besides the employees, certain projects also can be outsourced, which helps in saving the additional employee costs onboard as well as get access to outside talent and technology, helping in optimizing the resources.

4. Benchmarking: A set of standards, used as a point of reference for evaluating performance or level of quality. The best practice comparison mechanism.

1.9.3 Cost Reduction: A permanent reduction in cost and evaluation of activities and resources that can reduce cost and value the performance of the services provided by the institution.

1. Alternative Materials: Substituting materials by regulating its quality and maintaining the predetermined values in services.

2. Bulk purchase: Framing out a larger purchase so as to make use of discounts and reduce cost on an overall basis.

3. Value Analysis: Element wise detailed evaluation of cost to introduce cost reduction and to feature various aspects of services provided. Solely to have a continuous improvement of cost.

4. Alternative Labour: Substituting labour by regulating its quality and maintaining the predetermined values in services, for instance utilizing trainee instead of a qualified labour.

1.9.4 Hospital Performance: The measurement of a hospital is central to quality improvement; it provides a means to define what the hospital actually does, and to compare that with the original targets in order to identify opportunities for improvement.

1. TOR: The bed turnover rate essentially defines the period for which a bed is occupied and indicates the speed with which patients on any bed are rotated.

2. OP/IP: The number of outpatients are related to the number of inpatients. This is an indicator in which Inpatient services are being utilized in the hospital.

3. OT: The utilization of surgical operation facilities indicates the functioning of the hospital.

4. X-ray: A good indicator of how the hospital is functioning can be visualized through the utilization of X-rays and scanning machines.

5. Lab Tests: The availability and efficiency of diagnostic facilities in a hospital is indicated.

The entire concept of the study visualizes the intend of the cost management application in the healthcare sector.

1.10 RESEARCH METHODOLOGY

Theoretical concept of “research onion” is one among the ways for research methodology as proposed by Saunders et al. (2016)[12]. An exhausting description about the many layers or stages of research onion in a very well formulated methodology is accomplished through research onion. Raithatha (2017)[13.]

The main philosophy commences in this methodology with choosing of approaches, methods and strategies for a well-defined time horizons which further takes the research logic over to the research design i.e. the formation of the main techniques and procedures of data collection and analysis.

The research onion concept was developed by Saunders et al. (2007)[14]. It describes the layers that must be covered while developing a research strategy. Each layer of the onion describes has a more detailing stage of the research process, when viewed from outside Saunders et al. (2007)[15].

The methodology of research used for this study is presented below:

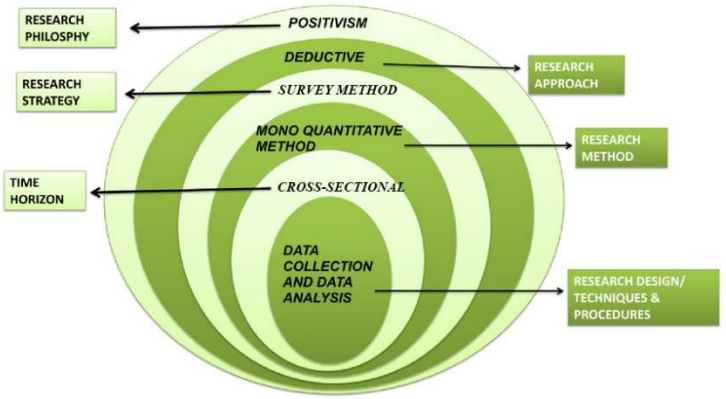


Fig.1.2: Research Onion

1.10.1 Research Philosophy

It refers to the set of beliefs that concerns the nature of reality investigated Bryman (2012)[16]. The research philosophy explains the assumptions inherent in the research process. It is the definition of the nature of the knowledge. A research philosophy assumptions provide justification on how the research will be undertaken Flick (2011)[17].

In other words, what is the nature of truth or knowledge is a research philosophy question. In fact, there are four research philosophies used, namely (1) Positivism (2) Critical realism (3) Interpretivism and (4) Pragmatism. These are classifications that are based on ontological, epistemological and axiological assumptions.

Ontology examines how a person analyses the business world and the researchers choice is restricted to objective or subjective or a combination of both Thomas & Hardy (2011)[18]. Here, the researcher used objective approach in developing a new knowledge.

Epistemology explains the method of finding reality and the related theories. The acceptable values and genuine knowledge is also explained in this stages and how the knowledge is conveyed to also. A quantitative or qualitative or a combination of both is enhanced here. The scholar frames quantitative criteria for interpreting knowledge in the field.

The performance of values and ethics within the research method is evaluated in the concept of Axiology. Thomas & Hardy, (2011)[19]. The researcher in this research has used positivism as the research philosophy. Positivism elaborates the reality that exists independently. Newman (1998)[20].

The philosophy actually provides a justification for the methodology.

1.10.2 Research Approach

For the generation of knowledge there are three approaches namely,

1. **Deductive approach:** This approach pinpoints the hypothesis upon a pre-existing theory and further formulates the research approach Silverman (2013)[21].

2. **Inductive approach:** This approach features a move from the specific concept to the general concept Bryman & Bell, (2011)[22].

3. **Abductive approach:** A form of logical inference which begins with an observation or set of observations and seeks for the most likely explanation for the study observations.

This research inculcates on validating the existing theories of cost management and therefore the deductive approach has been utilized.

1.10.3 Research Strategy

The strategy of how the researcher intends to carry out the work is explained in this layer. Saunders et al. (2007)[23].

The researcher has used survey method for concluding interpretations to the research objectives.

1.10.4 Methodological Choices

The research onion outlines the choices which includes the mono method, the mixed method, and the multi-method Saunders et al. (2007)[24]. There are several methodological choices which includes:

1. Mono quantitative
2. Mono qualitative
3. Multi quantitative
4. Multi qualitative
5. Mixed methodology

This research enhances mono quantitative method.

1.10.5 Time Horizon

The time framework of the project is within which completion is intended. Saunders et al. (2007)[25].

Cross sectional time horizon for an already established framework, where the data is collected at a point of time. Goddard & Melville (2004)[26].

The research is based on Cross-sectional time horizon.

1.10.6 Research Design

Basically, there are three research designs used namely exploratory, descriptive and explanatory research designs. Exploratory research is used to provide insights into and an understanding of the problem confronting the researcher. Descriptive research, as the name suggest, they describe the phenomenon without establishing association between factors and explanatory research focuses on an aspect of a study in detail. The study designed here is a descriptive study. Various prevailing cost management practices have been studied alongside the cost structure of Modern science hospitals in Kerala. The awareness level of Activity Based Costing technique in the Modern Science hospitals' of Kerala are also examined.

1.10.7 Source of Data

Both secondary and primary data have been utilized for the study.

Secondary Data necessary for the study were obtained from the published reports, earlier studies, and books in connection with this topic, relevant journals, articles, government publications and newspapers. This includes the following:

1. Harvard Business Review
2. International Journal of Marketing
3. Management Accountant
4. International Journal of HealthCare Research (IHRJ)
5. Journal of Healthcare Management
6. Healthcare Management Science
7. Healthcare Management Review
8. Journal of Cost Analysis and Management
9. International Journal of Strategic Cost Management
10. Journal of Cost Management
11. International Journal of Science and Research
12. The Accounting Review
13. Journal of Public health
14. Journal of Management Accounting Research
15. Medical tourism magazine

Primary data

There are two main stakeholders in this sector, namely hospital management who invest money and run the hospitals and the patients who avail the healthcare services. Hence, the researcher identified two set of informants for collection of primary data namely hospitals and patients. Since, the number of hospitals and patients who avail the hospital services are very large, a census survey is not practically feasible and thereby the researcher employed sampling method.

1.10.8 Selection of Hospitals

The population frame for the selection of hospital sample is the private Modern Science hospital in Kerala. There are altogether 731 such hospitals in Kerala spread over 14 districts. This include general, multi-specialty and super specialty hospitals.

At the first stage the researcher has divided the whole state into three regions namely north, central and south. In the south region all the five districts of the state via Thiruvananthapuram, Kollam, Alappuzha, Pathanamthitta and Kottayam are included. In the central region four districts of Ernakulam, Idukki, Thrissur and Palakkad are included. The remaining five districts of Malappuram, Wayanad, Kozhikode, Kannur and Kasargod in the northern part of Kerala are included in the north region. From each region one district is selected at random by using lottery method. Thus, for south region Thiruvananthapuram, central region Ernakulum district and north region Malappuram district are selected at the first stage. Detailed list of all hospitals in these three districts are compiled by the scholar with the help of District Medical Officers and IMA representatives of respective districts. The details are given in the graph (Figure 1.3) below.

From each of the selected districts 30 hospitals are selected as the samples for collecting primary data representing General and Multi-Specialty hospitals in the ratio of 1:2 by using stratified random sampling method.

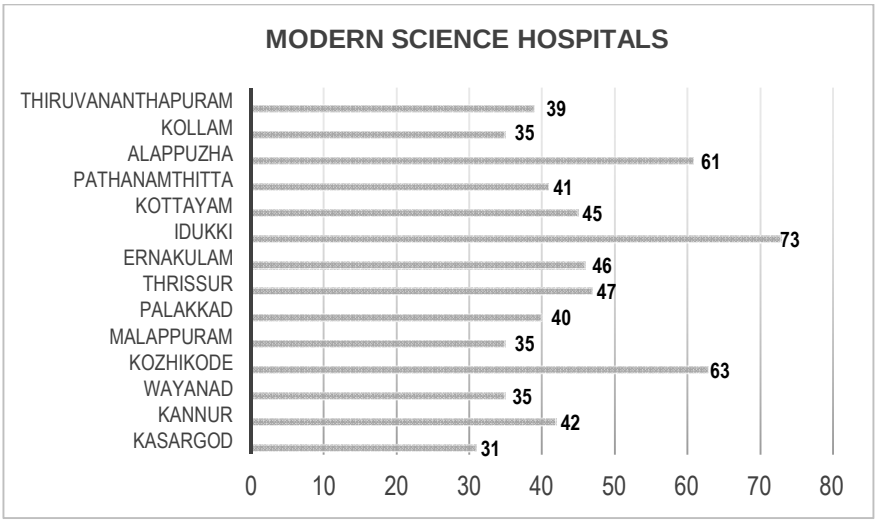
Thus, altogether 90 hospitals have been selected representing 30 General hospitals and 60 Multi- Specialty hospitals for all the three districts together in the state of Kerala.

1.10.9 Selection of Patients

From the 90 hospitals selected for the three regions of Kerala, five patients were selected at random from each hospital (one each from the four identified services i.e. consultation service, radiology service, lab service and operation theatre service) making a total of 450 samples patients for the study.

1.10.10 Target Population

The study emphasis on Private Modern Science hospitals of Kerala. There are 633 Modern Science hospitals in Kerala.



Source: Primary Data

Fig. 1.3: Population Frame

1.10.11 Sample Unit

Modern size hospital is the sample unit for the study. For examining the price sensitivity of the patients towards the healthcare services, patients availing any one of the identified four services of these hospitals have been taken as the sample unit for the study.

1.10.12 Sample Size

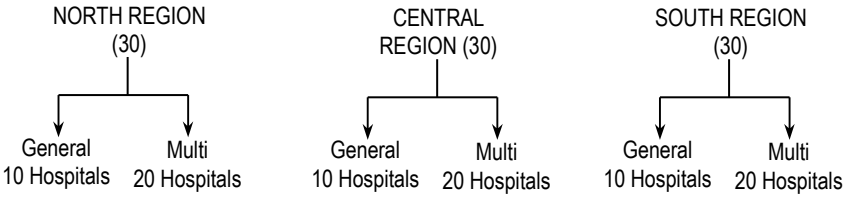
The sample size for the study is 90 hospitals. Using Roasoft software, the sample size was determined. For further analysis the link is attached.

http://www.raosoft.com/samplesize.html

(Margin of Error: 5%, Confidence level: 95%, Population size: 120, Response distribution: 50%)

1.10.13 Sampling Method

Stratified Random Sampling has been used for the study. One district is randomly selected from the classified three regions of Kerala. In total of 90 hospitals from the three regions are summarized for the study. 30 hospitals from each district have been chosen randomly. The quantum of General and Multi/Super Specialty Hospital is 1:2, in this proportion 10 General and 20 Multi-specialty hospitals have been considered.



1.10.14 Scaling Technique

For analyzing the prevailing cost management practices, 7 point Likert Scale has been used in view of the informants' knowledge. In case of price sensitivity, patients were interviewed using 5 point Likert Scale.

1.10.15 Research Instrument

For the preparation of interview schedule expert opinion was chosen.

1.11 VARIABLES USED

The following variables are used to analyze various aspects of cost management.

Table 1.5: *List of Variables Used*

Sl. No.	Purpose	No. of Variables Used	Name of Variables	Source
1.	Classification	7	1. Type of hospital 2. Bed size classification 3. Adoption of cost management practices 4. Bed Occupancy rate 5. Quality Accreditation 6. Region wise 7. Years of establishment	Harris (1976)[27] Bhagawathi (2012)[28] Devakaran and O'Farell (2015)[29]
2.	Study Variable			
	a. Price Sensitivity - Patients	4	1. Detailed price analysis for choosing the hospital service 2. Charged more for the hospital service 3. Price Sensitivity Rating Price Comparison	1. Nachtmann, H.and Al-Rifai (2004)[30] 2. Hilsenrath et.al (2015)[31] 3. Laurila et.al (2000)[32]
	b. Price Sensitivity – Institutional	3	1. Consumer complaint on pricing of service 2. Priority for patients' price sensitivity 3. Affect due to change in price	1. Vogler(2012)[33] 2. Mamun et.al (2014)[34] 3. Chapman (2014)[35]
	c. Cost Structure (Charu Chandra, 2009)	3	1. Material Cost 2. Labour Cost 3. Overhead Cost	1. Šiškina et.al (2010)[36] 2. HSCIC (2015)[37]
	d. Activity Based Costing – Aggregate Awareness	4	1. Awareness Level 2. Interest 3. Implementation 4. Activity Analysis	1. Popesko (2013)[38] 2. Rajabi and Dabiri,.(2011)[39] 3. Stole (2007)[40] 4. ICAI,(2015)[41]

Sl. No.	Purpose	No. of Variables Used	Name of Variables	Source
	e. Cost Management	12	1. Cost Planning • Cost relevance • Cost Planning • Cost critical • Cost appropriation method 2. Cost Control • Value Engineering • Responsibility Centre • Benchmarking • Outsourcing 3. Cost Reduction • Value Analysis • Bulk purchase • Alternative Material • Alternative Labour	1. Cokins (2006)[42] 2. Cooper & Kaplan (1991)[43] 3. Xu et.al, (2012)[44]
	f. Performance Indicators	5	1. Bed Turnover Ratio 2. Outpatient /Inpatient Ratio 3. Number of Surgeries 4. Number of x-rays 5. Number of Lab tests	ICAI,(2015)[45]

1.12 PILOT STUDY

For the purpose of the study, the scholar has prepared two detailed interview schedules, one for the hospital management and the other for the patients in order to collect the primary data. The schedule involves all the aspect of the study. Expert opinion has been collected from the experts in the field for the purpose. The interview schedule have been pre-tested with 10 hospitals and 25

patients and on the basis of the feedback received it has been modified before finalizing it. The scholar has also validated the research instruments with reliability analysis. .

1.13 RELIABILITY TESTS

The research made use of the tests as mentioned below:

1.13.1 Normality Test

To analyse the perfect normality in the data distribution (which is seldom achieved), ± 2.58 indicates rejecting the normality assumption at the 0.01 probability level, and ± 1.96 signifies a 0.05 error level Hair et.al, (2010)[46]. The researcher examined the normality by using the SPSS Software Package in this study, by applying the skewness, all the outcomes of construct seems to be normal.

1.13.2 Content Validity

It is the extent to which a scale or set of measures accurately represents the concept of interest Hair et al., (2010)[47] and ensures the ability of a scale to measure the intended concept. Face/content validity ensures that the measure includes an adequate and representative set of items that tap the concept. On the face of it, the items that measure the various concepts showed adequate coverage of the concept. In order to obtain content validity, a panel of experts examined the research instrument and they were asked to give their comments on the instrument.

1.13.3 Reliability Analysis

For analyzing the internal consistency of the scaled statements, the researcher conducts a reliability test using Cronbach's Alpha Reliability Analysis.

Table 1.4: *Reliability of scales*

Study Variables	No. of items	Reliability study (Cronbach's alpha)
Price Sensitivity - Patients	4	.884
Price Sensitivity – Institutional	3	.944
Activity Based Costing – awareness level	4	.875
Cost Management Practices	12	.853

As tabulated in the Table 1.4, Cronbach's Alpha for the scaled statement was 0.88 for the price sensitivity analysis among patients, 0.94 for the cost consciousness of the hospital and 0.88 for ABC awareness level, which was higher than the standard Cronbach's Alpha of 0.7. The test proves internal consistency and the interview schedule can be considered highly reliable.

1.14 METHOD OF CONTACT

Undisguised interview method was used for collection of data. Mechanical and manual design were followed by the researcher.

1.15 DATA ANALYSIS

The data gathered from the sample of hospitals of private sector were processed and analyzed using descriptive and inferential statistics by employing the Statistical Packages for Social Sciences (SPSS 22). Independent sample t test, analysis of variance (ANOVA) and Post Hoc analysis for testing the hypotheses of the study.

For analyzing the data, following tools were utilized:

Sl. No.	Tool	Description
1.	Mean, Standard Deviation and Percentage	A measure that is used to quantify the amount of variation or dispersion of a set of data values.
2.	Independent Sample t test	Determines whether there is a statistically significant difference between the means in two unrelated groups.
3.	ANOVA	Determine whether there are any statistically significant differences between the means of two or more independent (unrelated) groups.
4.	Tukey HSD – Post Hoc test	When the assumption of homogeneity of variances is met, Tukey's honestly significant difference (HSD) post hoc test is a post-hoc test based on the range distribution.
5.	Correlation Analysis	A method of statistical evaluation used to study the strength of a relationship between two variables.
6.	Regression Analysis	A statistical procedure for analysing associative relationships between a dependent variable and one or more independent variables.

1.16 OPERATIONAL DEFINITION

HEALTH: Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

HEALTHCARE: The organized provision of medical care to individuals or a community. In other words, the prevention, treatment and management of illness and the preservation of mental and physical well-being through the services offered by the medical, nursing and allied health professions.

HOSPITAL: An institution providing medical and surgical treatment and nursing care for sick or injured people within a minimum of three medical departments including General Medicine.

COST: The quantity expended for the services attained. Cost is the resource sacrificed or forgone to achieve a specific objective. The quantitative aspect of cost is taken in the study.

COST AWARENESS: The level of cost recognition within the organization. Whether cost is absorbed as a part of rational thinking or it's unique to profit considered. The understanding capacity of the Hospital administration on the cost served through services rendered.

COST STRUCTURE: On the basis of cogst elements i.e. material, labour and overhead, synchronizing cost to attain a fair view of absorption. As per the CAS -1, the nature of cost is considered.

LABOUR

Physician, Clinical Labour, Non- clinical labour form part of the labour for the study.

MATERIAL

Includes medicines and consumables like gown, gloves, safe swab, suture material, disposable blade, bitardine instrument, draining pad, mopping pads etc.

VALUE

The term value refers to the increase in the usefulness of the product or services and as a result its value to the consumers. Value to patients: the outcomes achieved for treating a medical condition relative to the costs incurred over a complete care cycle. Value for healthcare is to achieve better outcomes at the lowest possible cost.

1.17 PERIOD OF STUDY

For the research, the data collection is done mainly through structured interviews, observations and secondary sources include journals, magazines, books, articles and websites. The period of primary data collection is from 3rd May, 2016 to 24th November, 2018.

1.18 LIMITATIONS OF THE STUDY

Like any other social science research this study is not also free from limitations. The researcher faced several difficulties during the study period. It was found that not many hospitals were practicing scientific method of managing cost, which initialized a tedious process to share information.

1. Most of that data were qualitative in nature, which had to be quantified for the purpose of the study. Limitations of the scaling technique apply for this study also.

2. The collection of data was during the busy hours of work, therefore the mood of work counts the collection process.

3. Lack of support to share the information, in purview of confidentiality.

4. Recall errors form part of the data as the method of interaction bounded memory recollection.

5. The collection of data from among the patients who availed identified services of the particular hospital has been mechanized.

6. The limitations of the sampling method persist.

However sincere efforts have been taken to reduce the errors.

1.19 CHAPTERISATON

The thesis has been chaptered on the basis of the objective of the study. The first chapter gives an overview of the Indian healthcare sector, in concern to the Kerala model of healthcare and discusses the statement of the problem, significance of the study with the objectives of the study and research methodology.

A review of prior research associated with genesis of cost, cost management healthcare, cost control, cost reduction and Activity Based Costing technique are discussed in Chapter II. It includes discussions on how cost management is a relevant decision and the influence of Activity Based Costing technique in healthcare sector.

Chapter III discusses the theoretical framework of the study. The chapter discusses the theories underlying their relationships.

Chapter IV, includes a summary of price sensitivity towards the hospital service, the analysis of price sensitivity from both patient and institutional point of view, also the basic findings pertaining to prevailing cost structure of the healthcare sector and the key findings from it.

Chapter V, begins with the level of cost management, the various factors analyzed in the cost control and cost reduction

measures. Another section of this chapter deals with the awareness, interest and implementation phase of Activity Based Costing.

Chapter VI focusses in the identification of whether cost management practices of a hospital has any relationship with the hospital performance indicators and

Final Chapter VII discusses the main findings of the study, implications of the findings and scope for future research.

References

1. World Health Organisation (1999). The world health report 1999, Geneva.

2. Eisenberg (1986). Prosocial Moral Judgment and Behavior in Children: The Mediating Role of Cost, *Journal of Personality and Social Psychology*, 12(4), 426-433.

3. World Health Organisation (2017). *World Health Statistics 2017: Monitoring health for SDGs*, Global Health Observatory, Geneva.

4. Gujral, S., Dongre, K., Bhandari, S., Subramanian, P.G., Narayan, H.K.V., Mahajan, A., Batura, R., Hingnekar, C., Chabbria, M., and Nair, C.N. (2010). Activity-based costing methodology as tool for costing in hematopathology laboratory, *Indian Journal of Pathology and Microbiology*, 53(1), 68-74.

5. Koyama, W. (2000). Lifestyle change improves individual health and lowers healthcare costs. *Methods of information in medicine*. 39(3), 229–232.

6. Ridderstolpe, L., Johansson, A., Skau, T., Rutberg, H. and Ahlfeldt, H. (2002). Clinical process analysis and activity-based costing at a heart center, *Journal of Medical Systems*, 26(4), 309-322.

7. Flieschman, R.K and Parker, L.D. (1991), British Entrepreneurs and Pre-Industrial Evidence of Cost Management, The Accounting Review, 66(2), 361-370.

8. Johnson, H. T. and Kaplan, R. S. (1987). The Rise and Fall of Management Accounting Management Accounting, 68 (7), 22.

9. Aldukhil, Y. (2012) *Developing and testing a model of successful adoption of ABC*, Victoria University.

10. Compton, T. R. (1996).Implementing Activity-Based Costing, *The CPA Journal*, 66, 21-24.

11. Pavlatos, O. and Paggois, L. (2009), Activity Based Costing in the hospitality Industry: Evidence from Greece, *Journal of Hospitality and Tourism Research*, 33, 511-520.

12. Saunders, M.N.K., Lewis, P. and Thornhill, A.(2016). *Research methods for business students* (8th ed.), Pearson, India.

13. Raithatha, Y. (2017). *Understanding the economic impact terrorism has on the destination decision making: Northern Irish tourists*, Dublin Business School.

14. Op. Cit.12

15. Ibid.

16. Bryamn, A. (2012). *Social Research methods* (4th ed.), Oxford University Press

17. Flick, U. (2011). *Introducing research methodology: A beginner's guide to doing a research project*. London: Sage

18. Thomas, R. and Hardy, C. (2011) 'Reframing resistance to organizational change', *Scandinavian Journal of Management, 27,322*–31.

19. Ibid.

20. Newman, I. (1998). *Qualitative-quantitative research methodology: Exploring the interactive continuum.* Carbondale: Southern Illinois University

21. Silverman, D. (2013). *Doing Qualitative Research: A practical handbook*. London: Sage

22. Bryman, A., and Bell, E. (2011). *Business Research Methods* (3rd ed.) Oxford: Oxford University Press.

23. Op. Cit. 14

24. Ibid.

25. Ibid.

26. Goddard, W. and Melville, S. (2004). *Research Methodology: An Introduction*, (2nd ed.) Oxford: Blackwell Publishing.

27. Harris, J.E. (1977).The Internal Organization of Hospitals: Some Economic Implications, *The Bell Journal of Economics*, 8 (2), 467-482.

28. Bhagawathi, K. (2012) *Healthcare management (Case study of three Superspeciality Hospitals in Vishakhapatnam)*, Acharya Narajuna University, Andhra Pradesh.

29. Devakaran, S. and O'Farell, P. N. (2015). The impact of hospital accreditation on quality measures: an uninterrupted time series analysis. *BMC Health Services Research*, 15, 1 - 14, DOI 10.1186/s12913-015-0784-5.

30. Nachtmann, H.and Al-Rifai, M.H. (2004). An application of activity based costing in the air conditioner manufacturing industry, The Engineering Economist,49, 221–236.

31. Hilsenrath, P., Eakin, C. and Fischer, C. (2015). Price-Transparency and Cost Accounting: Challenges for Health Care Organizations in the Consumer-Driven Era, The Journal of Health Care Organization, Provision, and Financing, 1–5. DOI: 10.1177/0046958015574981

32. Laurila,J., Suramo, I., Brommels, M., Tolppanen, E., Koivukangas, (2000). Activity-Based Costing In Radiology:Application in a pediatric radiological unit, *Acta Radiologica, 41 189–195.*

33. Vogler, S., Zimmermann, N., Habl, C., Piessnegger, J., Bucsics, A. et al. (2012), 'Discounts and rebates granted to public payers for medicines in european countries', *South Med Rev* 5 (1), 38–46.

34. Mamun, A., Rahman, M.K. and Robel, S D (2014) A Critical Review of Consumers' Sensitivity to Price: Managerial and Theoretical Issues, *Journal of International Business and Economics*, 2(2), 1-9.

35. Chapman, C., Kern, A., and Laguecir, A. (2014). Costing Practices in Healthcare, *Accounting Horizons*, 28 (2), 353–364. DOI: 10.2308/acch-50713

36. Šiškina , A., Juodis, A. and Apanavičiene, R. (2010). Evaluation of the competitiveness of construction company

overhead costs, *Journal of Civil Engineering and Management*, 15(2), 215-224.

37. HSCIC (2015). Prescribing costs in hospitals and the community: England 2014-15.

38. Popesko, B. (2013). Specifics of the Activity-Based Costing applications in Hospital Management, *International Journal of Collaborative Research on Internal Medicine & Public Health*, 5(3).

39. Rajabi, A. and Dabiri, A. (2012). Applying Activity Based Costing (ABC) Method to Calculate Cost Price in Hospital and Remedy Services, Iran J Public Health, 41(4), 100–107.

40. Stole, L. A. (2007), Price discrimination and competition, *Handbook of industrial organization*, 2221–2299.

41. The Institute of Cost Accountants of India (2015). *Guidance on Cost Management in Healthcare Sector*, New Delhi: ICAI

42. Cokins, G. (2006) *Implementing Activity Based Costing* , Montvale, NY : Institute of Management Accountants

43. Cooper, R., and Kaplan, R. S. (1991) Profit priorities from activity-based costing, *Harvard Business Review*, May – June.

44. Xu, Y., Elgh, F., Erkoyunces, J.A., Blankole, O., Goh, Y., Cheing, W.M., Baguley, P., Wang, Q., Arundachawat, P., shebab, E., Newnes, L. and Roy, R. (2012). Cost engineering for manufacturing: current and future research, *International Journal of Computer Manufacturing*, 25(4&5).

45. Op. Cit.41

46. Hair, J., Black, W. C., Babin, B. J. & Anderson, R. E. (2010) *Multivariate data analysis* (7th ed.). Upper Saddle River, New Jersey: Pearson Educational International.

47. Ibid.

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Chapter II

LITERATURE REVIEW

2.1 INTRODUCTION

Fluctuating health cost is an unpressured knot in the calculations of budget. Maintenance of health is an issue unambiguous for the nation's economic growth. The management of cost is terminal in the journey of quality and destination of efficiency in the Healthcare Sector.

Through the absorption into different areas, the concept is clarified with importance over circumstance. Genesis of cost management explains the origin and relevance of cost management to the alignment of finance and the background of business. One of the most important decisions that a manufacturing company should make is to determine the product mix that will maximize the profit. To proportionate the index of Activity Based Costing, reflections of Activity Based Cost absorbs the crux along with its pros and cons in various fields including wine manufacturing, laboratory tests, marble industry etc. ABC implicitly takes a longer - term view by recognizing that, overtime, these indirect costs can be changed and hence are relevant to management choices. Strategies choices drive activities in ABC, there are three essential steps in establishing an ABC system: defining the activities that support output, defining

the links between activities and output and developing the cost of activities. The current status of cost management under various circumstances is described by a new state-of-the-art hospital indulging that high qualified human element such as the cost manager is an important parameters to increase the performance efficiency. Cost measurement, cost of errors and product diversity are continually changing overtime.

There are several literature available in the area both at the conceptual and empirical literatures. These literatures are reviewed and presented under three broad headings namely (i) genesis of cost management (ii) reflections of Activity Based Costing (iii) a new state - of- the - art hospital in chorological order from latest to the earliest.

2.2 GENESIS OF COST MANAGEMENT

Shivaraj (2015)[1] explains that focus of cutting is primarily on bolstering margins, some of the immediate effects may lapse in delivery and quality of product. Consumers are often very sensitive to these changes and rightly so, as they become unintentional recipients of the cost-cutting exercise. Cost Optimization focuses on consumer value rather than just on cost reduction is emerging as a viable alternative.

Mariques et.al (2014)[2] claims costing subsystem as a key element of any organization information, which is why it is important to know how the costing information is shared among the

rest of the systems within a company. At the adoption and broadcasting level of the systems depends on the knowledge that the assured companies could have about it.

Ramachandhran (2014)[3] identifies attributes such as management errors, regulatory approvals, error/rework that might be the cause for project cost escalation. The life cycle cost of a project COMPASS (Cost Control Strategy and Planning) methodology assists management in evaluating the potential degree of cost escalation.

Fisher (2013)[4] portrays that shifting focus from control to creativity value for the firm through cost reduction and increases in asset productivity, inducing ABC express greater confidence in their information.

Hibadullah et.al (2013)[5] explores lean management practices that include supplier management, employee involvement, just in time, consumer focus and statistical process control to monitor quality. The core principle concludes the elimination of non-value added activities, waste from the business etc.

Thomas & Larsten (2012)[6] examines the quest regarding ‘what are the cost from the management point of view – the main starting points for cost cutting, Does size, operating mode or quality standard correlate with the management style or cost structure, the basic cost drivers behind different types of cost

concluding that to apply cost management, cost transparency is a pre-requisite. Cost management is important as the capacities are rising while there is no opportunity for rising prices.

Yilmaz (2012)[7] brings out two ways to measure business cycle, through calculation of the loss of output from the full employment level, agents dislike risk, costs, and willingness to pay, to avoid business risks. Investigation in the area is relevant to fulfill the best of our knowledge, no empirical evidence concerning how large are the costs of business cycles and understanding the fact in the special case of a developing country is segmental.

Mulimani (2012)[8] scrutinizes cost effective analysis involving an assessment of both cost and effectiveness. There are standards for cost-effectiveness, but at times, perfectly adhering to these standards is not realistic, and compromises are often made, that may be entirely scientifically legitimate. Service Costing is that form of operation costing which applies where standardized services are provide either by an undertaking or by a service cost centre within an undertaking.

Xu et.al (2012)[9] This study states that the area of engineering practices where engineering judgement and experience are used in the application of scientific principles and techniques to problems of cost estimating, cost control, business planning and management science, profitability analysis, project management and planning and scheduling. The epistemic uncertainty caused by

lack of knowledge is arguably more difficult to quantify and will require fundamentally different strategies.

Vazakkidis et al (2010)[10] organizes the problem recognized as the public sector aims at the continuous improvement of quality of the provided services. Cooperation of new technologies and new methods of management, can resolve all the deficiencies of Public Sector, so as citizens and comparison will be better served.

According to **Afanasyev (2010)**[11] consumer's service values and delay costs are interdependent because the disutility of construction delay is larger for residential cabinet makers and commercial specification consumers. The higher the content quality, the more a consumer suffers if there are data transmission delays. Thus, the delay cost is interdependent with the value of the content to the consumer. A delay in cost structure makes both a structural and practical difference in the analysis of competing congestion prone service providers.

Jabbour (2009)[12] portrays in service industry, costs are not extensively used to make pricing decisions. They are extensively used to plan and control via responsibility centres, often linked to the problem of capacity management.

In the opinion of **Shim & Siegel (2009)**[13] before the dawn of industrial century, costs and price of products only depended on some directed costs which are classified as variable costs today

such as: direct labor, direct materials, and manufacturing overhead. All of these will be divided equally based on some fixed criteria such as direct labor hours. However, when the accounting scientists focused more on the costs study aspect, they discovered that except direct costs as mentioned in documents, there are some other costs which can be considered as indirect costs like maintenance, tooling, production control, purchasing, quality control, storage and handling, plant supervision and engineering costs. Unlike directed costs, these did not be changed during a long period when any changes occurred in the volume of products.

Cokins (2006)[14] explains that in ABC cost assignment network, each product incurs its own activity costs with a cause-effect relationship, not with an arbitrary indirect cost allocation. This then creates layers of costs that produce many profit margin layers.

Ananad (2004)[15] opines that the cost management systems changed acutely from the few financial measures to a broad set of perspective to achieve corporate mission. Difficult time has its own merits, displaying its relevance through innovative skills and creativeness are its fair outcome.

Deo (2001)[16] delve into the concreteness of cost as a basic measure of productivity. Resource Cost productivity, a measure of resource use efficiency to determine the productivity loss of a production process. If the cost per unit of output reduces by making

improvement in the system, then the productivity of the system increases and if the cost increases, the productivity of the system decreases relating to the greater than zero value. Resource Cost Productivity effect is an indicator that the system may further be improved by organizing the resources in the production process. Operation Based technique is also new technique developed to accurately measure the productivity loss in production system.

Smith & Betley (2000)[17] are of the opinion that cost sharing can be an effective means of cost control but may not be preferred to more selective means employed by managed – care plans. Evaluation of 'what works' and 'which is better' configures the status of cost.

Marshall et.al (2000)[18] scrutinizes to compare the effect of manipulating different variable to reduce cost and the regression analysis presents those cost effect in an easily interpretable manner.

Ceo & O'Sullivan (1993)[19] recommends three types of indirect costs need to be charged to cost centers; Equipments and materials used on the job , Departmental costs that cannot be charged directly to the daily work performed, Overhead services provided to live departments by such staff agencies as personnel, purchasing, accounting, the legal department and auditing. The key reason why costs are understated is that the indirect costs of performing work are not properly accounted for and reported. Indirect cost relates to hidden cost. When the full cost is known

choices informed can be made out, subsidies, work output and quality can be procured.

Flieschman & Parker (1991)[20] proves that the evidence for a relatively mature cost management has been found in four major areas of activity: cost control techniques, accounting for overhead, costing for routine and special decision making, standard costing in 1980's. The four categories of cost accounting activity are cost control, accounting for overhead: complex product – cost calculations, costs for routine and special decision making, standard costing: associated with awareness of cost savings.

According to **Cooper & Kaplan (1991)**[21] not only direct materials, direct labors and direct manufacturing overhead costs but also indirect cost such as indirect materials and installing and maintenance costs are to be distributed depending on the required activities of each products or services. However, during the production process, there are some other sustaining costs. This can be individual or group. Therefore, these expenses should be divided separately to related activities of products or services based on a factor which is called cost driver rate. This will increase the reliabilities of data and help managers make the best decisions for specific support productions activities.

Dharmarajan (1985)[22] found that the high cost of labour coupled with its bargaining strength has led to a large scale migration of industry. Production estimate through process,

processing methods, identify process cost, structuring total cost are the gradual steps in reforming the cost structure.

2.3 REFLECTIONS OF ACTIVITY BASED COSTING:

Another area extensively researched by the scholar is the different aspects of ABC.

Dubihlela & Rundora (2014)[23] extracts the reason why firms do not implement ABC involving, lack of managerial commitment, lack of training facilities, lack of ABC knowledge, resistance to change, high cost of implementing ABC system. ABC is a weapon to cushion SMEs from the unstable business environment in order to ensure their survival and growth. The four key components of ABC method include employee training, managerial commitment, ABC implementation and performance of SMEs.

Kaplan (2014)[24] comments that the system rely on inaccurate and arbitrary cost allocations and provide little transparency to guide attempts by first line care provides to anticipated and modify the true drivers of their cost. Adoption of ABC has been widely used in industries outside healthcare to improve operational process and help managers make better decisions about resource allocation, product and service mix and pricing. Few reasons occupy the providers cannot readily benchmark the cost of treating a clinical condition at different sites because (a) costs are rarely measured over a complete cycle of

clinical care (b) most costs are allocated arbitrarily and inaccurately to patients, making these costs irrelevant to clinical measures (c) differences in costs due to variations in the prices of inputs. Moreover compensating the major barrier was the misaligned fee – for service reimbursement system, when encouraged high cost, potentially inefficient care. Alike the bundled payment reimbursement has the potential to motivate providers to deliver healthcare efficiently, to minimize or eliminate complications and to optimize outcomes.

In the words of **Phai et.al (2014)**[25] revival stage business units face a more dynamic environment than maturity stage units and pursue innovation and product diversification in an attempt to reinvigorate the unit. ABM practices are expected to be crucial for revival stage units for a number of reasons. As in the case of growth stage, the relative advantage of ABM information is high due to the increased product diversity, overhead costs and complexity.

According to **Tanur (2013)**[26] ABC is created to respond to the need of the companies retrieve correct cost information per product and also use this information in strategic decision making. It also fulfills the need of the market to gain significance out casting efficiency and practicality. It signifies that the only way that a firms' survival in the pure competition market is to control their costs which will eventually lead to an increase in profit margin. In the light of trends, companies tried to search for ways to

control their cost budget by accurately providing product cost information that can be used in pricing decisions. ABC model can be used in decision making and strategy creation which would be used to guarantee long term success and help them gain the ability to react to the emerging trends in the markets. Cost accounting symbolizes the role of cost allocation, cost tracing and data retrieval. The types of activity cost drivers are transaction drivers, duration drivers, intensity drivers under the classification approach of facility level, product level, batch level and unit level.

According to **Damjanovski (2013)**[27] the value of ABC methodology is mainly anticipated in the fields of cost control and profit analysis, as well as in the areas of process optimization and decision making, where its assumed to be creating conditions for increased financial performance and improved level of operational efficiency. The business process is a network of activities with common purpose, so the activity costs belongs to processes. The benefits are assessed for some of the company's key finances and business aspects which include cost controlling and budgeting, profitability analysis, optimization of key process in the company as well as its impact on decisions making process.

According to **Levant & Zimnovitch (2013)**[28] TDABC lays the principle of equivalence methods, according to the which a multi-product or multi-activity firm is brought down to an entity that manufactures only one product, by considering all of its production in terms of multiple reference unit. Like the Phoenix

reborn from ashes, advanced equivalence methods were to have new lease of life in the 1990's in the form of UVA method and TDABC method. Allocating overheads drawn of the sections' homogenous methods. Tracing the words of Paul Valery, 'Everything that is simple is false, everything that is complex is unusable' reflects the evolutionary volume of costing methods.

Pandey (2012)[29] explains visibility into cost of service and cost control are critical. By using activity based costing to understand their true costs, healthcare providers can avoid many potential pitfalls that can result from using traditional costing methods. Accounting costs are particularly likely to deviate from true costs in the hospitals, where there tends to be broad acceptance of historical charges for service without clear visibility into cost of service delivery. For each of the service package, all cost elements must be identified, for example: time invested by physicians, nurses and other staff, pharmaceutical consumables cost, medical equipment utilization cost and infrastructure cost. Adopting ABC as the method for calculating service costs requires a substantial commitment and it could challenge long held beliefs, habits and priorities. Nonetheless the belief gained from a better understanding the organization's actual cost makes it well worth the effort.

Cannavacciouolo et.al (2012)[30] on an aspect of RBV the steps involve: structuring phase, i.e. construction of are sources portfolio containing all the resources controlled by a firm, bundling

phase firms combines its resources to construct or modify its current capabilities. The leverage phase focuses on the application of firms' capabilities to create value for consumer and wealth for owners. ABC methodology fits well the need as (i) it is a technique of cost analysis based on the concepts of process and activity (ii) it makes it possible to determine the cost of an object on the basis of the activities and resources that it consumes. The steps also involve to map resources, activities, competencies and the links among them.

Xu (2012)[31] highlighted that ABC is underutilized in many developing countries despite its huge success in the developed world as a redefined costing system that provides effective information for cost management. The main objective of ABC is to obtain more accurate costing information. In developed countries behavioural issues overwhelm technical ones. The study reveals that there are major impediments in relation to successful implementation of ABC in developing countries owing to their vastly different business, economic and cultural environment. Findings of the study indicates that one of the positive outcome of implementing ABC was significantly improved relations between accountants and operational managers. Lack of awareness and expertise of ABC in developing countries may have had bearing on this outcome, the cross culture difference did have impact on successful implementation. The key factor leading to the successful

ABC was top management support. 7 characters of ABC outlays time, quality, service, cost, speed, efficiency and importance.

Tuominen & Anselmi (2012)[32] claims that through scheduling of the whole process succeeded is an important aspect to choke point the process while providing hands-on information about the workload involved in this kind of follow-up of individual activities. Activity Based Costing attempts to identify the most relevant cause and effect relationship for each activity pool instead of just attempting to find the most obvious and easiest-to-link numerical cost driver for indirect costs.

According to **Aldukhil (2012)**[33] top management support is the critical factor for the success of ABC implementation, and its significance has been emphasized by several studies. ABC success lays on process cost improvement, non-process cost improvement, revenue improvement and consumer satisfaction.

Khataie (2011)[34] pointed out that the main purpose to show how ABC/M acts as a common cost accounting, information and managerial approach to syndronize the two mentioned models and to introduce the combination as a hybrid decision support system. ABC/M as a two-stage cost accounting process, (1) breaking manufacturing overhead cost into different cost pools and (2) assigning manufacturing overhead cost through appropriate activity cost drivers to the cost.

Kayrbekova (2011)[35] highlights the challenges affecting life-cycle costs of advanced, complex and integrated offshore oil and gas production facilities. The research demonstrates a comparison of the conventional and non-conventional cost systems, LCC analysis and AB-LCC. The study focuses on the influence of good quality cost assessment of the selected technical solution alternatives on the tool life cycle cost of an offshore oil and gas production facility to be used in the harsh, remote and sensitive environment. Performing credible cost analysis challenges the lack of knowledge, experience, research and published data and information. AB-LCC helps to determine how many resources need to be spent on each activity which has to be performed on the production facility directed towards Activity Based and Environment Management.

According to **Cokins & Capusneasse (2011)**[36] cost objects consume activities and these resources. Resources costs are assigned to activities based on their resources and activity costs are reassigned to cost objects (outputs) based on the costs objects' proportional use of those activities. The objective of an ABC/ABM system is to provide knowledge to managers and employees, not just basis data. The objective is to assist employees to shift from being reactionary to being activities participants where they can intelligently create and shape the future of their organization.

According to **Huyen (2011)**[37] ABC is the best tool for refining cost system and enhancing the effectiveness of the

business. Cost reducing, products quality improvements and saving manufacturing time can be listed as three main benefits that ABC can bring to organizations in operating performance aspects. Although more detailed and precise information is a huge strength of ABC, it is also a weakness of this method. Moreover, implementing ABC method also needs many objective factors such as market competitiveness, core business and the information technology infrastructure quality.

According to **Popesko et.al. (2011)**[38] application of the ABC in healthcare institution entails a number of predictable benefits, especially the ability to quantify the actual costs of activities, to identify the relationship between the costs and means of carrying out these activities, to identify capacity influences on the overall costs of the organization and in the assessment of legislative issues regarding the reimbursement of particular performances to also measure the "profitability" of provided operations. It is necessary to view profitability in this case as an identified discrepancy between the amount of reimbursement for a certain performance and the actual (full) cost after taking into account all overhead costs.

Levin & Sallbring (2011)[39] conducted a study with the objective to develop a cost estimation system that enables the salesperson to estimate the cost in order to improve the four problem areas. These constitute, categorization of expense leading to identifying main activities, establishing matrix, replacing

checkmarks by proportionating the matrix, obtaining values to values, accelerating activity product dependence, replacing checkmarks in the matrix to finalize obtained values of product. The basic idea summarized is that the resource driver should express the use of resources for different activities.

Suthummanon et al (2011)[40] proves that an ABC system gives visibility to how effective resources are being used and how all activities contribute to the cost of a product. Furthermore, ABC allows creation of a costing system that provides management with reliable cost information. It would be an important aid in making management decisions, particularly for improving pricing practices by making costing more accurate. The three methods adopted for allocation of indirect costs: equal allocation- resources cost is allocated equally to all object that consume the resources, output based allocation – resource cost is allocated according to an output related allocation base, ABC allocation - resource costs are accumulated into activity cost pools based on how much of the activity is consumed by the objects. ABC method are deployed across the internal value chain.

Marques et al (2010)[41] contend that most hospitals with costs management systems, use the absorption method. Traditional costs methods have caused distortions in indirect costs and financial reports normally do not provide the managers' interpretations and actions for the control of deviations related to

specific problems also, their actions are rarely reflected in accounting reports leading to frustration.

Stouthuysen, et.al. (2009)[42] describes in detail obstacles existing in procedures of accurate cost driver selection and the data collection. The possible way of the simplification of the system is the application of time-driven activity-based costing system (TDABC).

Troche (2009)[43] argues that the cost level in the conventional systems is too aggregated to present value analysis of any activity because product costs are not broken down by activities. Thus, the objective of traditional costing system are inventory valuation and financial reporting. Four different methodological approaches for determining costs include intuition, education gaining, Traditional Cost Accounting, Activity Based Costing. ABC makes indirect cost direct.

According to **Guan et.al (2009)**[44] while quality and time are important improving these dimensions without corresponding improvement in financial performance may be futile, if not fatal. ABC's major source of information for activity based management. Two dimensions include – cost dimension and process dimension.

Patel (2009)[45] explains that overhead costs are allocated from cost centers to cost objects through various methods such as surcharges and activity allocations. ABC implementation enhances the cost management functionality. All overhead cost are still

assigned to cost carrying out a process that allocates the cost of those resources to the process. The process is then consumed by cost objects (such as production orders) and the related costs are allocated to those cost objects. Cost centre accounting answers the question of where cost occurs, whereas ABC answers the question of why (for what purpose) cost occurs.

Pavlatos & Paggois (2009)[46] derives through the purpose of the study as to provide some empirical evidence of the current general trends regarding the practical consideration, adoption and use of activity – based costing in hospital industry. Often ABC is driven by the need to improve consumer profitability analysis, to gain accurate information on cost for pricing, to prepare relevant budgets. ABC applications involve service pricing, consumer profitability analysis, service – mix, performance evaluation, budgeting, cost reduction, cost modelling, output, service design, overall price etc. ABC initially reflects the true cost.

According to **Aykol et.al (2007)**[47] ABC measures cost and performance of activities, resources and cost objects. It also ensures that high impossibility to sustain competitiveness without an accruable cost calculation mechanism. It is argued that using multiple cost drivers reduces the risk of distortion and provides accurate cost information. Cost drivers are often measures of the activities performed such as number of units produced, labour hours, hours of equipment time and number of orders received etc. The existence of the ABC database is an advantage for BSC

applications since its financial phase recommends an ABC implementation. Kaizen application and BSC can give the firm great advantages in the short and long run under the scope of ABC.

Kaplan & Anderson (2007)[48] is of the opinion that ABC corrected serious deficiencies in traditional cost systems. The traditional systems categorized cost into three elements: material, labour and overhead. Through automation and industrial engineering driven efficiencies, the percentage of total costs represented by the somewhat arbitrary allocations of Overhead had continually increased in the twentieth century. Time driven incorporates variations in the time demands made by different types of transactions.

Shaik (2006)[49] contend that ABC can radically change how managers determine the mix of their product line, identify the location for sourcing components and assess new technology. The danger that only those incremental costs that are uniquely attributable to individual products will be classified as relevant for decision making.

González et.al (2006)[50] opines that quality cost ratio is the highlight of business with traditional cost proving useless as they do not provide relevant information about the cost and their management. Through the study of wine making, in order to face the complexity and variety of wine making process, the use of ABC system was adapted for wine making process. The stages evolving

pre-fermentation, fermentation and post fermentation orders the sequence for ABC.

Martin (2006)[51] constitutes an ABC model requires 1) identify the main activities 2) determining the primary and secondary drivers for the activities 3) aggregating activities into homogeneous cost pools and selecting activating measures to represent each pool or cost driver.

Aho (2006)[52] investigates the implementation of a real time ABC in a manufacturer along with the profitability, consumer relationship or a product development process. Distortion in costs is common in conventional costing systems as costs are using for example a volume measure. ABC analysis refer to the graph of cumulative profits as the whole curve. The study plots cumulative profitability versus consumers. The height of the hump of the whale indicates that the profits earned by the business units most profitable products. The remaining products, breakeven and loss bring total profits down to sea level. ABC system represents a shift from a strictly financial perspective to a holistic whole-system perspective because they include both financial and non-financial data in its reporting. The main motivation for a company to implement and use ABC is the need for reliable cost information. The focus should be on the most critical activities that will add value to consumer or help the effective operation for business.

Gecevska & Anisic (2006)[53] are of the opinion that expense activity dependence matrix catalogues systematically ensure success. A cost system based ABC requires organizational changes, employees acceptance, investment in software and hardware, equipment for data collection. A smooth transition from a traditional costing system to ABC, it does not require a high investment in sophisticated data collection systems and doesn't require a serious organizational restructure for small companies.

According to **Cooper & Slagmulder (2005)**[54] in a world when the globalization becomes a trend of the societies, ABC can be considered as a popular and dominated costing technique for most of the organizations. In the past, profit means you had a list of potential consumers who can buy a huge quantity of products in many times. However, this might be not right in reality. Profitability not only depends on the quantity but also the differences between the price and the costs. In fact, the higher the differences, the higher the profitability. Unlike traditional method which allocates costs equally among products, ABC divides costs based on the requirements of costs objects like products, services and jobs.

Cokins (2005)[55] points at the number of disadvantages, such as high complexity of the system or large amount of non-financial data requirements in introducing ABC technique.

In the words of **Janne (2005)**[56] ABC implementation research has developed from rationalistic survey-based research to case based research addressing institutional factors. Business units following a prospector strategy are more likely to adopt activity-based systems because they continually implement and change organization as they seek out new opportunities. ABC is a technical system specially designed for the management of Overhead and product diversity, especially in the globally competing manufacturing Industry.

Cardinaels et.al (2004)[57] states that more developed cost systems such as activity-based costing (ABC), may facilitate strive for cost efficiency. ABC provides more detailed cost information on the activities of the hospital, which could typically result into better cost reduction and cost management.

Cohen (2004)[58] contend that in ABC system there is no direct relationship between production volume and cost consumption. There are three categories of cost drivers which can be chosen in an ABC model – transaction drivers, duration drivers and intensity drivers. The purpose of stage modification is to trace activity costs to cost objects and way to reach the goal is to choose the appropriate activity cost drivers.

Anand et.al (2004)[59] brings an attempt to capture the development in cost management practices such as accounting for overheads, application of budgetary control and standard costing

among Indian corporates. Better insight for benchmarking and budgeting with the ABC cost system yet the consistency in priority is lacking unlike the firms are using traditional costing system. According to the scholar, a wider spread is conceptualized by ABC and standard costing leaving the Traditional Costing system.

Ali (2004)[60] argues that ABC recognizes that in long run most manufacturing costs are not fixed and it seeks to understand the forces that causes overhead costs to change over time. ABC system use volume-related cost drivers such as direct labour hour or machine hours' drive the consumption of power. The benefits to be received from introducing an ABC are dependent upon the diversity of service or products of a company, the level of degree of competition and the number of products or services sold. The more competitive the operating environment, the greater demanded will be the need for accurate costing.

Cooper (1988)[61]**; Ittner et al. (2002)**[62] Using a more complicated but high detailed calculation method, ABC plays an important role in decisions making process as well as operational process of managers. Cost cutting and cost control savings characters enhances the position of ABC in developing value added products or services while still maintain an effective cost resources. One of the most popular implementation of ABC is scorecard balance which provides a fair judgment among various products and services. In other words, this is a flexible, precise and detailed costing method. In previous researches, ABC is referred as a task

for accountants to identify the key products or services, cost drivers and related activities cost assigning.

Bhatta (2001)[63] brings down the particularity with revolutionary industrial technique and the present day computer support. The study intends that any business however strong it is will have to torch the future in order to have competitive edge over others through competitive excellence. The crux of ABC is well focused, it details that ABC is capable of accurately dissipating the indirect costs to the end product. It eliminates cross subsidization of indirect costs among the products. There is no problem in identifying the direct cost (predominantly direct material) with the products especially in the wake of automation and hence, this process is related to backyard.

Rajaraman (2001)[64] relies the fact of managing real time. ABC itself is not an end in itself and will not result profits, what is required is the translation of insights from an ABC analysis into action to tap the full potential for profit improvement.

Garrison & Noreen (2000)[65] explains the different steps towards implementation of ABC:

a) Activity Identification
b) Activity Analysis
c) Cost Assignment
d) Activity Rates of Calculation
e) Assignment of Costs to Cost Objects

f) Preparation and Distribution of Management Reports

Mullins & Zorn (1999)[66] investigated that cost centre containing both high volume and low volume products or services will tend to overcast high volume products relative to low volume products, which is mainly because of indirect costs such as overhead distribution and marketing are usually constant over a range of different volumes or grow at a declining unit rate relative to volume. Fudility and change in the service delivery environment, characteristic of local often create instability in measurement and assignment of cost. On the other hand, ABC traces costs according to activities performed in contrast to traditional cost system which allocate indirect costs (and even some direct costs) on the basis of single measures of product volume and input (such as labour, machine hours and material dollars).The latter approach fails to adjust for differential relative resource usage across products or process unrelated to the relative volume of production.

Sallivan et.al (1999)[67] observations demonstrate the use of the ABC approach together with the theory of constraints (TOC) philosophy in determining the optimal product mix and restrictive bottlenecks of a company. A basic assumption of ABC is that cost pools are homogeneous, which means that the costs of activities in each cost pool should have same cause – effect relationship with the chosen cost driver. ABC is a long term oriented traces cost of resources used in production, may lead to wrong information in short run. Traditional Costing is Value Based Cost System. A good

rule of thumb is not to have more than 20-25 activity centres for an ABC project.

Innes & Mitchell (1998)[68] configures the distinguishing difference of ABC from conventional methods raised by the treatment of overhead costs which are not related directly to the volume of activity. The first stage of ABC being similar to the conventional cost accounting process but, the support and output activities to that consume the resources by assigning costs to each of the resources, thereby giving visibility to the breakdown of the total expense. Moreover, line/activities possess true profitability but the principle objections to the form of management accounting are the efforts required to implement such a system.

According to **Pohlen & LaLonde (1994)**[69] ABC can assist logistic managers by revealing the links between performing particular activities and the demands those activities make on an organizations' resources. ABC increases management visibility into how products, consumers or supply channels consume work and resources. ABC has provided the leading logistics firms with a more accurate system for costing activities and measuring performance. The level of ABC sophistication employed appears to be based on the firms' objective, ongoing capability to track activity information, the proportion of indirect costs, and the diversity of products, services, consumers or supply channels.

Dopouch (1993)[70] in the study highlighted that ABC may be moving too far in the direction of deriving normative implications. Potentially, different cost estimation function can be derived using a general ABC analysis, falling within the category of materiality

Babad & Balachandran (1993)[71] argues that the goal of cost management is to provide relevant and timely information to the management. ABC has also been extended into activity-based management to include other considerations such as, consumer profitability, manpower utilization, distribution channels and other management issues. ABC reveals cost and profitability structure on the other hand ABM scoops consumer profitability, manpower utilization, distribution channels and other management issues.

2.4 A NEW STATE-OF-THE-ART HOSPITAL

The researcher conceptualizes the recent trends in the arena of hospital industry in this part of the review.

Tomlin et.al (2015)[72] consummate that using indirect standardization, small groups of patients using high cost medicines influence general practices expenditure on pharmaceuticals. Factors such as patients' needs, age, previous experience, time constraints and reliance on drug company information may lead to different prescribing choices. This also indicated differences in patient demographics and morbidity.

Zarai et.al (2015)[73] Past studies on influencing variables is concentrated mainly on behavioural, organizational and technical aspects; while studies on the role of organizational and technical aspects and the role of culture in ABC success has been rare to the study. The factors impacting ABC include external environment, individual characters, organizational factors, technical factors and task characteristics.

Emry & Brantes (2015)[74] points out the little reason to doubt that many provider groups and health systems want a more rational payment system and are willing to make painful changes to accommodate value-based payment. But employers often pose a significant obstacle to such changes and weren't willing to fundamentally change their employees' benefit plans. Quickly moving from an opaque and paternalistic system to a system that is transparent and driven by consumer action - a more reminiscent of the financial industry's transition from local banks and savings amount to online day trading and mutual funds.

Dyas et.al (2015)[75] The application of lean to healthcare is widely debated in the study. The cost per patient hour has been formulated by dividing the total activity costs to the multiple of the total number of patients over the period in which the costs cure incurred and the average time spent by a patient in the activity. Process improvement involves factors like time reductions could result in an increase in employee turnover, staff reductions could lead to a decrease in consumer satisfaction ratings and inventory

reductions could lead to a decrease in consumer satisfaction ratings and inventory reductions could hamper disaster preparedness.

In the words of **MacMillan (2014)**[76] a major motivation for managing the utilization of laboratory testing is to reduce the cost of medical care. The process of laboratory testing includes three distinct components termed the pre-analytic, analytic and post analytic phases. Operating cost is casted over capital budget and operating budget. Job order accounting and process accounting are two generally used approaches for calculating the cost in a test.

Kaplan & Haas (2014)[77] contents in this study is developed through the missteps that keep us paying too much for treatment is counterproductive and ultimately leading to higher costs and sometimes lower quality care. The line-item expense categories on the profit and loss state formulating reduction are usually made without considering the best mix of resources needed to deliver excellent patient outcomes in an efficient manner.

Kalicanim & Knezevic (2013)[78] argue that accuracy of cost information is conditioned by finding adequate relationship between overhead costs and cost objects, identifying and tracing cost drivers and output measures of activities and by monitoring cost behaviour of different levels of product. Moreover, value analysis releasing a step towards consumer satisfaction. The want of gain, keep or improve its competitive advantage, which is condition sine qua in modern business, should perform its primary

and secondary activities more efficiently than its competitors. Cost tracing, analysis and management entails making quality and accurate operative and strategic decisions as a basis for the long term orientation of a company. The true cost that predominantly affect costs (cost drivers) are in each activity in the value chain. These are: economy of scale, experience curve, cost of key inputs, and connections with other activities in the value chain and value system, savings made by vertical integration or by outsourcing, strategic choices and operational decisions about the services provided to consumers, the number of functional and other characteristics of the product, the amount of wages etc.

Phatshwane & Baliyan (2011)[79] the study contend that the use of ABC has been effective tool for planning and budgeting in both private and public healthcare settings. The advantage of ABCM systems is that it allows better understanding and control of activities, at the same time giving insight on how resources are demanded by the activities in the delivery of a service bringing change in orientation and culture of cost management.

Bhagawathi (2010)[80] defines Healthcare as a multitude of services rendered to individuals, families or communities by the agile of health service or profession, for the purpose of promoting good health. Medical care ranges from domiciliary care to resident hospital care and it refers chiefly to the personal services that are provided directly by the physicians or rendered under their instructions.

Cokins & Capusneasse (2010)[81] The strategic purpose of a cost driver has been analyzed through the case factors that changes the nature of costs to be allocated. The basic purpose of an allocation base (or factor) has been visualized very well in the study. The cost driver quantities are the case of producing structural changes of activity costs and resources expenses. In case of the level of allocation of indirect cost, we find three types of cost drivers: the resources level, activity level and cost object level.

Sumagna (2009)[82] explains that management of complex tasks involved in treating a patient particularly for the one suffering from complex ailments, healthcare resource management is a serious issue. Proposing an architecture to implement treat flow management is structured and deals with healthcare involving human life which must specify precautions to exceptions. Workflow process are marked by dimensions; control flow dimension – ordering of tasks, resource dimension – identifying their rules, care dimension – individual cases. Moreover three phase of span of treatment i.e. Adhoc – suitability of patient is studied, Adapt – refined to suit the patient, Adopt – found progressive, adopted for continuation.

Callaghan et.al (2007)[83] interprets that direct healthcare costs one component of medical cost refer to the resources consumed in delivery care to the patient and include costs of in-patient, out-patient and emergency care. The study emphasis on the healthcare costs which directly form part of the revenue system.

Hayward (2005)[84] argues that because the functional level of buildings are very complex, services need to be delivered jointly and the service mix and methods of operation are varied and, in most cases, unknown at the outset. Consequently, the challenges are how to deal with the uncertainty regarding changes in operational needs over time and how such changes should be considered when planning a healthcare facility.

Young (2000)[85] points out that the key to price sensitivity is the availability of substitutes. One of the difficulties in health care is that the product is often complex, the outcome unclear and information about prices, quality and effectiveness is hard to find and interpret.

Stromborn et.al (2002)[86] characterizes related to the cost of switching plan, substantial variation in price sensitivity related o expected healthcare costs: younger, healthier employees are between two and four times more sensitive to price than employees who are older and who have been recently hospitalized or diagnosed with care. Price conscious consumer choice is a market oriented healthcare reform proposals. The link between providers and plans will generate greater “brand loyalty” than that which occurs in other product markets.

Bescos et.al (2002)[87] explains the fact that Activity Cost Management can enable firms to make a more adequate allocation and the major reason that justify the adaption of ABCM are

comparable from one country to another, the dissatisfaction with the traditional cost accounting systems and belief that ABCM provide more accurate information. The study contributes the Canadian and French firms' reason for introducing ABCM involve ; to improve the accuracy of cost information, necessary for reduction, because the difference among products/service or because the product/service creation process were not reflected in their manufacturing costs alone. Need to review processing, change in the product/service creation process, increase in overhead outlays the few.

Shepard et.al (2000)[88] entangles concepts of Hospitals absorbing the bulk of health spending in most countries, evidence suggest that there is considerable scope for improving the management of these resources. By better understanding of various activities, managers can improve the efficiency of hospital departments as well as hospital systems as a whole. From the administrative point, cost centres can be distinguished according to the nature of their work – patient care, clinical care and overhead centres.

Stailey (1999)[89] presents the reduction of under used facilities and activities that duplicate effort, restructuring activities through intra- service and cross service consolidation, revitalization to attain a modern, efficient and effective laboratory environment with a focus on the costs of facilities and infrastructure.

According to **Atwal (1996)**[90] the pharmaceutical industry is now one of the most information intensive in the world, and problems of information management therefore, arguably more challenging in the pharmaceutical and healthcare industries than in most. Other areas of business; these industries may thus be viewed as paradigmatic in this context. They are increasingly global in their activities, with the need to accommodate regulations and standards at both international and national levels, and to maintain awareness of relevant new information worldwide. Information resources and procedures for the discovery, development, registration, marketing, and support of medicines are increasingly systematized into common practices across the world, and operated transnationally. The rate of change of impacting events constantly accelerates, and is the consequence of the growth of information output, pressure for innovation and competitive advantage, the globalization of markets, the convergence of technologies, and trends toward global harmonization of procedures.

William (1996)[91] scrutinized in search for non- value added activities that many companies have discovered ‘‘foggy, misty, grey’’ activities, which is unclear whether activity add value. This concept lay common in business that attempt to merge the entire business rather than just production with ABSs. To ensure the success of ABSs, activity levels, logical approaches and drill down cost allocations must be direct functions of these objectives.

Sundaresan (1993)[92] contend that tailoring the costing system to the needs of the institution with a complete sequence of elements including factors affecting hospital cost roves a line of action for efficiency. The necessity and significance of reducing cost of valuable hospital services hallmark the responsibility towards the mankind. The golden fruits of ever growing modern medical technology should be made available to all sections of the society at the lowest possible cost, the motto be best quality patient care at minimal cost.

Roy (1988)[93] contributes towards the various aspects which should be given consideration while designing a cost reduction program for a hospital. It includes:

a) Location of hospitals
b) Training program
c) Type of Building, Equipment and facilities
d) Staffing
e) Hospital Supplies
f) Utilities
g) Maintenance
h) Shared service
i) Management responsibility

Levitz & Brooks (1985)[94] concretes their study through measuring the performance utilization which consist of a series of indicators of financial condition, efficiency of resource utilization,

profitability and productivity. Total cost per patient – day and labour costs per case conditions the productivity.

According to **Donabedian (1983)**[95] there are three approaches to the assessment of quality: observation of structure, process, and outcome. Structure refers to the relatively stable characteristics of the providers of care, their resources, and the physical and organizational settings in which they work. The actual process of care is the primary object of assessment, but the judgment of quality is based on what is known about the relationships between process and the consequences of process for the health and welfare of individuals and society. The quality of the process of care is defined in terms of the norms of scientific medicine and the ethics and values of society. Outcome refers to a change in a patient's current and future health. Many consider measures of outcome to be the most valid indicators of the quality of care, but evaluations, especially those of hospital care, have tended to focus on structure or process. There are a number of reasons to place more emphasis on outcome measures. The most commonly available outcome measures, such as death, are usually too rare to detect small differences in care and frequently appear too long after the care to be useful.

Howard et.al (1981)[96] organizes micro and macro cost alongside cost control at operational levels. Cost Containment is defined as the attainment of operating efficiency within the constraints of providing a high standard of service to patients, i.e.

effectiveness. Efficiency cost is characterized as the extent to which the particular strategy under review accomplishes the goals at its purpose at minimum cost per unit of service rendered. Manifestation of cost consciousness involve complaints, activity, consultation, tension, reprisals and politicking.

Thomas (1965)[97] outlines that hospitals do not use cost accounting system in the traditional sense, instead they employ cost finding techniques. The objective of hospital cost finding is the accuracy in determining departmental cost. Even the most basic hospital accounting systems usually record direct expenses departmentally, but indirect cost must be calculated and then total cost properly allocated to different departmental functions or types of patients.

Lasser (1954)[98] conceptualizes that the theory of accounting in private hospitals should portray the patients charged according to the principle "what traffic can bear", but must consider cost also into account.

According to **Kaltman (1948)**[99] cost benefit analysis essentially entails a comparison of costs and benefits for a series of program, thoughts of as alternative or competitors for public funds. There are 3 categories of benefit:

1. Savings in the use of health resources
2. Gains in economic output
3. Satisfaction from better health

Buckingham et.al (2001)[100] Even though many Japanese manufacturers are aware that with increased automation in their plants, direct labor may not have a cause-and-effect relationship with factory overhead, they continue to use direct labor as the principal basis to allocate overhead because they are said to believe that using direct labor for this purpose provides organizational sub-units with an incentive to use less labor. In other words, the use of direct labor as the major allocation bases in Japanese companies provides a direct stimulus to automate production.

Punkari et.al (1995)[101] In cost and volume contracts, the total price for the health care services provided is defined in terms of the volume of services provided, bed-days, surgical procedures and outpatient days (and combinations of these, the treatment packages) being used as indicators of volume. Each treatment package is then assigned an average price, which is usually assumed to be cost-based. Thus, the purchasing municipalities can pay for the health services roughly according to their consumption of the service. If the actual demand differs from the estimate specified and budgeted in the contract, the financial risk is shared between the purchasing municipalities and the providing health care district.

The concept of cost management traced within various situations allocate the furnishing its options in financing profitability and the responsibility towards mankind. The dimensions of cost control and its reduction manages elements of

cost to be transformed. Relatively various studies discussed above focuses on the cost management strategies that altered the business crisis, the advantages of ABC that moved the competitive strategy in intending the current scenario of this industry. Pinpointing the strengths that outlay cost management and the scope due to the intensity of competition in the market which has bridge the scope of this study. To further elaborates, the slot for this study has been summarized through the strengths and weakness of the above reviews, which exerts that Kerala model of health care needs better cost management overview for sustenance in the industry. Moreover, the likelihood that prospers the hospital sustainability is very well discussed.

2.5 CONCLUSION

The concept of cost management traced within various situations allocate the furnishing its options in financing profitability and the responsibility towards mankind. The dimensions of cost control and its reduction manages elements of cost to be transformed. Relatively various studies discussed above focuses on the cost management strategies that altered the business crisis, the advantages of ABC that moved the competitive strategy in intending the current scenario of this industry. Pinpointing the strengths that outlay cost management and the scope due to the intensity of competition in the market which has bridge the scope of this study. To further elaborates, the slot for this study has been summarized through the strengths and weakness of the above

reviews, which exerts that Kerala model of health care needs better cost management overview for sustenance in the industry. Moreover, the likelihood that prospers the hospital sustainability is very well discussed.

Above reviews concentrates on the three aspects of the study. The first half elaborates the concept of cost management mentioned in various studies, the areas, origin, merits and challenges that formulates the management of cost. It further points out that to sustain the competition and its intensity in the market, cost management plays a vital role and has become essentially the need of the hour. Reflection of ABC is the second half, this part highlights the transformation of conventional costing method to the ABC technique. The reviews indicates that cost drivers and measurement of activities absorbs the momentum of cost rather that the traditional absorption rate methodology. Various studies redefine cost through the overhead management technique –ABC. Final half pinpoints the current scenario of hospitals and the trends that originate the corporate culture, visualizing that there exists a gap in identifying the cost structure of the hospitals and analyzing the cost management practices through the ABC awareness level.

This study indicates these gaps as its objectives which are fundamentally established.

References

1. Shivaraj, S. (2015). *Cost Optimization in select consumer product sector companies in India.* Gulbarga University, Karnataka.

2. Mariques, M.R., Clara I, Colonina, M. and Gerenciales (2014). Is the activity based system a viable instance for small and medium enterprise, The case of Mexico, *Vilarino Pastro* (30), 220-232.

3. Ramachandhran, M. (2014). *Study of Cost Escalation in Indian Building Construction Industry*, Anna University, TamilNadu.

4. Fisher, K.F. (2013). Influences on administrative costs in convenience store chains: A cross sectional Activity – Based system, *Academy of Accounting and Financial Studies Journal*, 17(3), 71-99.

5. Hibadullah,S.N., Nursyawani, Farah and Habidin, N.F. (2013). Lean Manufacturing Practices and Environmental Performance in Malaysian Automotive Industry, *Asian Journal of Finance and Accounting*, 5(1).

6. Thomas, D. and Larsten, B. (2012). Perception of Cost, cost drivers, human resource management, long and short term critical success factors in the hotel industry:

Recommendations for hotel management, *African Journal of Business Management*, 41(6), 1057-1080.

7. Yilmaz, E. (2012), Welfare costs of business cycles in Turkey, *Metro Economica*, 195 -211.

8. Mulimani, M.N. (2012) *Cost effectiveness of UGC- Infonet E-Journals consortium assessed by selected three University Libraries of Karnataka State*, Karnataka University, Dharwad.

9. Xu, Y., Elgh, F., Erkoyunces, J.A., Blankole, O., Goh, Y., Cheing, W.M., Baguley, P., Wang, Q., Arundachawat, P., shebab, E., Newnes, L. and Roy, R. (2012). Cost engineering for manufacturing: current and future research, *International Journal of Computer Manufacturing*, 25(4&5).

10. Vazakidis, A., Karagiannis, I. and Tsialta, A. (2010) Activity Based Costing in the Public Sector, *Journal of Social Science*, 3, 376-382.

11. Afanasyev, M. and Mendelson, H. (2010) *Service Provider Competition: Delay Cost Structure, Segmentation and Cost Advantage, Manufacturing and Service Operations Management*, 2(2), 213 – 235.

12. Jabbour, M. (2009) *The impact of Activity- Based Costing of management accounting technique on insurance companies' performance*, Brunel University, London.

13. Shim, J., K and Siegel, J., G (2009)*Modern Cost Management and Analysis (Barron's Business Library)* (3rd edition), Barron's Educational Series.

14. Cokins, G. (2006) *Implementing Activity Based Costing* , Montvale, NY : Institute of Management Accountants

15. Anand, M. (2004), *Activity Based Costing at Castrol India Limited, Management and Labour Studies*, School of Business Management and Human Resources, XLRI Jamshedpur, 29, 225.

16. Deo, B.S. (2001) *Operation Based Costing Model for measuring productivity in production systems*, University of Manitoba, Manitoba.

17. Smith, D.G. and Betley, C.L. (2000) Cost Management Activities PPOs, *The Journal of Risk and Insurance*, 67(2), 21-23.

18. Marshall, E., Homans, F. and Haight, R. (2000*). Exploring strategies for improving the cost effectiveness of endangered species management: The Kirtland's Warbler as a Case Study*, University of Wisconsin Press, 76(3), 462-473.

19. Coe, C.K. and O'Sullivan, E. (1993) *Accounting for the Hidden Costs: A National Study for Internal Service funds and other Indirect Costing Methods in Municipal Govt*., Wiley, 53(1), 59-64.

20. Flieschman, R.K and Parker, L.D. (1991), British Entrepreneurs and Pre-Industrial Evidence of Cost Management, *The Accounting Review*, 66(2), 361-370.

21. Cooper, R., and Kaplan, R. S. (1991) Profit priorities from activity-based costing, *Harvard Business Review*, May – June.

22. Dharmarajan, P.G. (1985), *The study of cost structure of the cashew industry in Kerala, Karnataka and Tamil Nadu*, CUSAT, Kerala.

23. Dubihlela, J. and Rundora, R. (2014), Employee training, managerial commitment and implementation of ABC; Impact on performance of SMEs, *International Business and Economics Research Journal*, 13(1), 27-43.

24. Kaplan, R.S. (2014). Using Time-Driven Activity – Based Costing to identify value improvement opportunities in Healthcare, *Journal of Healthcare Management*, 59(6), Nov/Dec.

25. Phai, T.N., Bairid, K. and Blair, B. (2014) The use and success of activity based management practices at different

organizational life cycle stages, *Internal Journal of Production Research*, 52(3), 787-803.

26. Tanur, O (2013) *Creating Product Portfolio Strategy via Activity Based Costing in food production*, Tampre University of Technology.

27. Damjanovski,S. (2013) *Applicability of ABC and related management tools: the case of Ipko telecommunications LLC*, Jubljana.

28. Levant, Y. and Zimnovitch, H. (2013) Contemporary evolutions in costing methods: Understanding these trends through the use of equivalence method in France, *Accounting History*, 18(1), 51-75.

29. Pandey, S. (2012) *Applying the ABCS in the provider organizations, Healthcare financial management*, November,112-120.

30. Cannavacciouolo, L., Landoli, L., Ponsiglione, C. and Giusseppe (2012) An analytical framework based on AHP and activity based costing to access the value of competencies in production processes, *International Journal of Production Research*, 50(7), 4877-4888.

31. Xu, L. (2012), *Implementation of Activity-Based Costing in Chine: A case study of a Chinese multinational Company*,

School of Accounting and Finance, University of Wollongong.

32. Tuominen and Anselmi (2012) *Activity Based Costing n Cost Management, The impact of KONE PSR on sales overhead cost*, Laurea - ammattikorkeakoulu, Hyvinkaa.

33. Aldukhil, Y. (2012) *Developing and testing a model of successful adoption of ABC*, Victoria University.

34. Khataie, A. H. (2011) *Activity Based Costing in Supply Chain Cost Management Decision Support System*, Concordia University, Canada.

35. Kayrbekova, D. (2011) *Activity Based Life Cycle Cost Analysis (Design, Operation and Maintenance in Artic Environment)*, University of Stavanger, Norway.

36. Cokins, G. and Capusneasse, S. (2011). *Sustaining an effective ABC/ABM system*, Theoretical and Applied Economics, Vol.18, 2(555), pp.47-58.

37. Huyen, N.T.T (2011) *A study on impacts and effectiveness of ABC costing method as a cost effective measurement in coal industry*, University College.

38. Popesko, B., Tučková, Z. and Strouhal, J. (2011) Calculation Methods for Costs Optimization in Health Care: A Preliminary View 2011, *Proceedings of the 2nd*

conference of the Institute for Environment, Engineering, Economics and Applied Mathematics: Circuits, Systems, Control (CSCS), (26-28). Prague, Czech Republic.

39. Levin, K.E. and Sallbring, S. (2011). *Implementation of Activity Based Costing- a case study at a make – to order company*, Packaging Logistics, Lund University, Sweden.

40. Suthummanon, S., Ratanamanu, Boonyannwat, N. and Pieanpon (2011) *Applying ABC to a parawood furniture factory*, The Engineering Economics, 56, 80-93.

41. Marques RC, Cruz NF, Carvalho P. (2010) Assessing and exploring (in)efficiency in Portuguese recycling systems using non-parametric methods. Resources, Conservation and Recycling, 67, 34–43.

42. Stouthuysen, K., Demeere, N. and Roodhooft, F., (2009) Time-driven activity-based costing in an outpatient clinic environment: Development, relevance and managerial impact, *Health Policy*, 92(2-3), 296-304.

43. Troche, G. (2009) *Activity Based rail freight costing – A model for calculating transport costs in difference production system*, Stockholm, Sweden.

44. Guan, Haun, Mocun (2009), *Cost Managemnet*, Cengage Learning, Indian edition.

45. Patel, N.K. (2009) *ERP SAVVEY*, The Management Accountant, Vol.444(9)

46. Pavlatos, O. and Paggois, L. (2009). Activity Based Costing in the hospitality Industry: Evidence from Greece, *Journal of Hospitality and Tourism Research*, 33:511.

47. Aykol, D.E., Tumel, G. and Bayhan, G.M. (2007) A comparative analysis of Activity-Based Costing and Traditional Costing, *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, 1(3), 136-139.

48. Kaplan, R.S. and Anderson, S.R. (2007) *Time Driven Activity Based Costing*, Harvard Business School Press.

49. Shaik, H.O. (2006). *Activity Based Costing system and its role in decision making in Gaza Strip factories*, The Islamic University, Gaza.

50. González, J.I., Gomez and Morini, S. (2006) 'Short Communication- an activity – based costing of wine, *Journal of Wine Research*, 17(3),15-203.

51. Martin J.R. (2006) *Management Accounting Concepts, Techniques and Controversial Issues*,(7).

52. Aho, M. (2006*) Implementation of integrated ABC in Holistic Database Management System and its implication*

for operations management, University of Technology, Lappeenranta.

53. Gecevska, V. and Anisic, Z. (2006) *Using ABC in Small and Medium Companies*, Annals of the faculty of Engineering, Hunedoara.

54. Cooper, R., and Slagmulder, R. (2005). Designing ABC systems for strategic costing and operational improvement, *Strategic Finance Institute of Management Accountants*, 81(2).

55. Cokins, G., (2005) *Activity-Based Cost Management: An Executive's Guide*, John Wiley and Sons.

56. Janne Jarvinen (2005*) Rationale for adopting Activity-Based Costing in Hospitals*, University of Oulu.

57. Cardinaele, E., Roodnooft, F. and Warlop, L. (2008). Competitive pricing in markets with different Overhead costs: concealment of leakage of cost information?, *Journal of Accounting Research*, 46(4), 761-784.

58. Cohen, H. (2004) *Implementing an activity-based costing model*, Nelson Mandela Metropolitan University, South Africa.

59. Anand, M., Sahay, B.S., Sahay, S. (2004), *Cost Management Practices in India : An Empirical Study*, ASCI Journal of Management, 33(1-2),1-13.

60. Ali, Y.I.M. (2004) *Decision Making for Production planning using Activity Based Costing and Fuzzy Goal Programming*, Zagazig University.

61. Cooper, R. (1988) The rise of activity-based costing – part two: when do I need an activity based costing system?, *Journal of Cost Management* .

62. Ittner, C. D., Lanen, W. N., and Larcker, D. F. (2002)The association between activity-based costing and manufacturing performance, *Journal of Accounting Research*, 40, 711 – 726.

63. Bhatta, H.S.M. (2001) Activity Based Costing and accounting, *Management Accounting*, 36,(8), 572-574

64. Rajaraman, N. (2001) Activity based costing and its implementation aspects, *Management Accounting*, 36(8), 575-581.

65. Garrison, R. and Noreen, E. (2000) *Managerial accounting*, Boston Massachusetts, McGraw-Hill/Irwin.

66. Mullins, D.R. and Zorn, C.K. (1999) Is Activity Based Costing Up to the challenge when it comes to privatization

of local Govt. Services, *Public Budgetary& Finance*, Summer, 358-377.

67. Sallivan, W.G., Killough, L.N, Van, E.M., Aken (1999), *An Activity Based Costing and Theory of Constraints Model for Product Mix Decisions*, Virginia Polytechnic Institute and State University.

68. Innes, J. and F. Mitchell (1998) *A Practical Guide to Activity-Based Costing,* London, Kogan Page Ltd.

69. Pohlen, T.L. and LaLonde, B.J. (1994) Implementing Activity Based Costing in logistics, *Journal of Business logistics*, 15(2).

70. Dopouch, N. (1993) A perspective on Cost Drivers, *The Accounting Review*, 68(3), 615-620.

71. Babad, Y.M. and Balachandran, B.V. (1993) Cost Driver Optimization in Activity Based Costing, *American Accounting Association*, 68(3), 563-575.

72. Tomlin, A.M., Gillies, T.D., Tilyard, M.W. and Dovey, S.M. (2015) Variation in the pharmaceutical costs of New Zealand general practices: a notional database linkage study, *Journal of Public Health,* 1- 9.

73. Zarai, B., Rad, R.S., Ghapanchi, F., and Ghapanchi, A.H.(2015) A heuristic Approach to the adoption and

implementation of Activity Based Costing information Systems, *The Electronic Journal of Information System evaluation*, 18(1).

74. Emry, D.W. and Brantes, F.D. (2015) Curing an ill healthcare system, *Healthcare Financial Management*.

75. Dyas, S.R., Doughty, T., Hays, M., Ivery, R., Spalding, J., Philips, R. (2015) Process – Improvement Cost Model for the Emergency Department, *Journal of Healthcare Management*, 60(6), 442-458.

76. MacMillan, D. (2014) Calculating cost savings in utilization management, *Clinica Clinicia Acta*, 123-126.

77. Kaplan, R.S. and Haas, D.A. (2014) How Not to Cut Health Care Costs, *Harvard Business Review*, 11, 116–122.

78. Kalicanim, D., and Knezevic, V. (2013) Activity based costing as an information basis for an efficient strategic process , *Economic Annuals*, 7(197), 5-119.

79. Phatshwane, P., Baliyan, P.S. (2011). Towards improved government budgeting, costing an accountability in the healthcare sector: The case of hospital and clinical services in Botswana, *International Journal of Economics and Business Studies*, 1&2.

80. Bhagawathi, K. (2012) *Healthcare management (Case study of three Superspeciality Hospitals in Vishakhapatnam),* Acharya Narajuna University, Andhra Pradesh.

81. Cokins, G. and Capusneasse, C. (2010) Cost Drivers, Evolution and Benefits, *Theoretical and Applied Economics*,17(8), 7-16.

82. Sumagna (2009) *Study on Healthcare workflow*, University of Hyderabad.

83. Callaghan, R., Prabu, A., Allan, R. B, Clarke, A. E, Sutcliffe, N., Pierre, Y.S., Gordon, C. and Bowman, S. J. (2007). Direct healthcare costs and predictors of costs in patients with primary Sjogren's syndrome, *Rheumatology* (Oxford), 46, 105-111.

84. Hayward, C. (2005). *Healthcare facility planning: Thinking strategically*, Health Administration Press: Chicago, IL.

85. Young, G.J., Meterko, M. and Desai, K.J.(2000). Patient Satisfaction with Hospital Care: Effects of Demographic and Institutional Characteristics, *Medical Care*, 38(3), 325-334.

86. Stromborn, B.A., Buchnueller, T.C. and Feldstein, P.J. (2002) Switching costs, price sensitivity and health plan choice, *Journal of Health Economics*,21,89-116.

87. Bescos, L., Canvin, E., Gosselin, M. (2002) Activity-based costing and activity-based management: A comparison of the practices in Canada and in France, *Activity based costing Compatabilite-Controle-Audit*, 229-244.

88. Shepard, D.S., Hodgkeh, D., Anthony, Y.E (2000) *Analysis of hospital costs: a manual for managers*, Brandies University (WHO – Geneva).

89. Stailey, R.J (1999). *Activity Based Cost and revenue model for RDT and E rated service account laboratories at Nawcad*, Noval Post Graduate School, Monterey, California.

90. Atwal, K. (1996) Discovering the art of successful IT, *Scrip Magazine*, 32-34.

91. William M.Bake (1996) *Take another look at ABC*, International management conference, January-February, 19-23.

92. Sundaresan, P.K (1993). *Cost Accountancy and Cost Control in Hospitals, School of Management Studies*, Cochin University of Science and Technology, Cochin

93. Roy, A. (1988), *Cost Reduction in Hospital*, Hospital Administration, 25,(81).

94. Levitz, G.S and Brooks, P.P (1985). Independent versus system – affiliated hospitals: a comparative analysis of

financial performance, cost and productivity, *Health Service Research*, 20(3), 315-319.

95. Donabedian, A., (1983). Evaluating the Quality of Medical Care, *Milbank Memorial Fund Quarterly: Health and Society*, 44, 166-206.

96. Howard, R. D., Patrick C. C., John C. W. and Joseph T. K. (2000) Accountant's Guide to Fraud Detection and Control, 2nd Edn, John Wiley & Sons, Inc., New York.

97. Thomas, B.W. (1965) *Encyclopedia of cost Accounting*, Englewood cliffs: Prentice Hall International, Vol.2, pp. 413-442.

98. Lasser, G.K (1954) *Hand book of Accounting Methods,* Van Hostrand Co. Ltd.,New York.

99. Kaltman, H.E. (1948) *Present status of cost – benefit analysis in the health field*, 57 (11)

100. Buckingham, M. and Loomba, A.P.S. (2001) Advantageous Cost Structure: A Strategic Costing Case Study, *Production & Inventory Management Journal*, 42(1), 12-18.

101. Punkari, M., Ihalainen, R., Pekurinen, M., Uutela, T., and Vohlonen, I., (1995) Experiencies in provider-purchaser model in health care in different countries, *Suomen lääkärilehti*, 50,1027-1032.

Chapter III

THEORETICAL OVERVIEW OF COST MANAGEMENT

3.1 INTRODUCTION

The goal of sustaining a competitive market is the strategic tool that follows the challenges. Compromising cost alongside quality deregulates the ethical values of the business. Health and its amenities cannot trespass the need of the hour and synchronize the necessity to admire the cost value. Designing of service is tuned to the lump sum ailment in health and also the unpredicted structure of cost.

An understanding of the price of a service involves some understanding of cost. Price and cost are indissolubly connected. Specifying the calculations in expense that is acknowledging transparency alone cannot retain the service quality. Health is the king of wealth and dominated by its highly natural cause and worth in mankind. Establishing a zeal with cost or the sacrifice to benefit a health service is a tremendous motion towards technology.

3.1.1 Pieces of Pricing Puzzle

Pricing is not mystical. Setting and changing of price represent a species of human behaviour that widely reflect perceptions, cognitions, aspirations and preconceptions. Moreover,

it also reflects the making of business decisions, the quality and availability of information motivation, environment and prior experience.

A price setter becomes deeply involved in atleast three usually quite separate areas of business: costing, finance and marketing. A blend of pricing and decision making forms essential for the survival of a product or service in the competitive market. The actions in business in general and in marketing and pricing in particular should be goal oriented, laying the action for a purpose. The importance of price comes from the influence on behaviour of important participants in the marketing process, who could be ultimate consumers, resellers, competitors, suppliers or government. If a shift in price would provoke rivals to take a strong and painful measure, price decisions must be considered vital. Price also affects the attitude of ultimate consumer towards the brand's quality, the hospital and its future changes in price and quality. Costs are the floor below which prices will not be set except in crisis situations. Competitors' price is a ceiling above which most sellers hesitate to set price except in unusual circumstances.

When consumers' value increases with quality and service, decrease with price.

3.1.2 Approaches to Pricing

Price as means of communication, communicates to most consumers more than about information about the sellers' monetary

demands. It says something about the quality, reliability and the nature of the people who avail the service. A price structure combines vertical and horizontal price differentials that must be viable in the face of operating costs and competitive circumstances. A company can pursue five objectives through pricing: survival, maximum current profit, maximum market share, maximum market skimming or product - quality leadership.

How elastic or responsive, demand would be to a change in price better forms the price for the service. Demand is likely to be less elastic under the following conditions:

1. There are few or no substitutes or competitors.

2. Buyers do not readily notice the higher price.

3. Buyers are slow to change their buying habits.

4. Buyers think that higher prices are justified. If demand is elastic, sellers will consider lowering the price. A lower price will produce more total revenue.

Eventually, demand sets the ceiling and cost sets the floor. The three Cs – the consumers' demand schedule, the cost function, and the competitor's prices lays a platform to select a price. Cost sets the floor to price, competitors' price and the price of substitutes' provide an orienting point. Consumer's assessment of unique product features establish the ceiling price.

1. Mark – up pricing: Estimating the total cost and adding a standard markup for profit. Markups are generally higher on seasonal items. By tying the price to cost, sellers simplify the pricing task.

2. Target – return pricing: The firm determines the price that would yield its target rate of return on investment.

3. Perceived value pricing: Consumers' perceived value is made up of several elements, such as the buyers' image of the product performance, the channel deliverables, the warranty quality, consumer support and softer attributes such as the suppliers reputation, trustworthiness and esteem.

4. Value Pricing: A pricing strategy in which a company sets prices and promotes it based on the value consumers perceive a service or good to have. The principle applies to markets where possessing an item add to a consumer's self-image or facilitates unparalleled life experiences.

5. Going rate Pricing: Where costs are difficult to measure or competitive response is uncertain, firm feel that the going price is a good solution because it is thought to reflect the industry's collective wisdom.

6. Auction type Pricing: One major use of auction is to dispose of excess inventories and use goods.

7. Group Pricing: A discounted price is presented before extended group of consumers.

To summarize, pricing a service or product forecast the scenario of market to be presented with. Certainly, costs are an inescapable ingredient for all decisions.

3.1.3 Role of Cost

Business computes cost for two main purpose: (i) to help them to perform their custodial functions (reporting to owners and tax authorities and attempting to uncover dishonesty and inefficiency) and (ii) for decision making purpose. Cost is a composite of numerous elements – some direct and some imputed, some fixed and some variable, some provable and some theoretical. Expenses and benefits are the linear factors associated with cost, benefit received for the sacrifices made is an intended value of cost over actual. Negotiating the need with the expenses stipulates the value in cost, an ultima of sacrifice for the benefit. Categorizing cost is mainly concluded with material, labour and overhead cost as its elements. Variation in the proportion of these elements cannot be nullified with difference in sector.

Traditional costing systems have proved their inability and inadequacy to support pricing decisions in a complex competitive business environment since they are aimed at allocating to the total cost on the basis of consistency rather than relevance.

Relevance is valued more than objectivity and auditability, though whatever data used must be defensible and transparent to organizational participants. Organization uses information about costs to make important product feature and product mix decisions. Organization acquire productive capacity: committed costs, the amount of committed costs is related to the planned level of activities and is incurred independent of how much use is made of the committee resources during the period. A cost criteria pertains to a homogeneous group of tasks, i.e. activities by factor that affect the amount of the costs, for example in the process of storage cost of activities may be dependent: place, time, stock value etc. Flexible costs: out of flexible resources - raw material, labour, fuel.

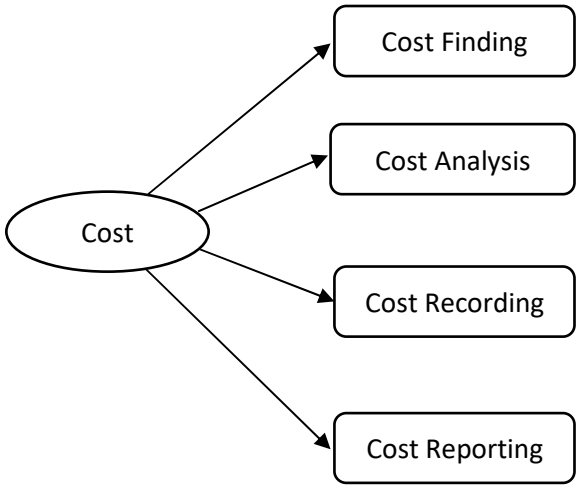

Fig.3.1: Tasking of cost

3.1.4 Cost Classification

Element wise detailed evaluation of cost to introduce cost reduction and to feature various aspects of services provided, solely to have a continuous improvement of cost. Raven defines, an analytical technique designed to examine all the facets and cost of a product in order to determine whether or not any item of cost can be reduced or eliminated, while relating all functional, performance and quality requirements. Segregation of cost on the aspect underlined to mark a difference in the stereotyping of the cost formulation. Consumption of material is the absorbent in a product or service. A direct relation in formation of the product or service is congenial in formulating the direct material as an element of cost. Tying a knot with the bunch of aspects which are essential in loading characteristic purview of material also joints its elemental cost. Productive in an aspect of study is dimensional to the elements it subordinates. Driving a series of material is logical to the essence of relation it pursue to the material content as a whole. The character of material along with its value in a product or service serve its role as an element to cost.

Tasking of labour to mould a product or service is generalized in direct and indirect manifold. Relational features sense the extent of fold to which labour may deal. Classification of labour is bound to the necessity of its product manufactured or

service rendered. Fraction of series in activities formulate the purpose of labour in manufacturing and service sector. Evaluating the traditional mode, direct material and direct labour dominated the factory cost.

Along with material and labour, other expenses which cannot be directly integrated to a product or service i.e. overhead form part of the cost elements. Dignified by the status of indirect expense, a mere recognition cannot seal its presence. Absorbing the indirect material, indirect labour and indirect expense in a product or service is closely divisional to the part it plays in the entire cost generation. Apparently a convenient method of cost provides a thrust for cost formulation. Traditional costing systems based on volume based allocation of overhead have lost relevance in a manufacturing environment that has seen a sharp increase in overhead and a subsequent decline in direct labour.

Top – Down Costing

Costing is intended to serve as a basis for appropriate pricing procedure in the absence of adequate market signals owing to the imperfections in the healthcare market. The overriding aim of costing is to ensure that the full cost of the product is allowed for the calculated cost. This is called top – down costing. The steps in the top – down approach are to:

1. Identify the total, hospital-wide costs that are expected to be incurred in the year. This is calculated on the basis of resource inputs and utilization, expected levels of outputs, and any agreed surplus/deficits generated in a year.

2. Classify costs in a standardized form such that they can be allocated to the services specialties that form the basis of the global budget.

This approach is defined over various steps. The figure 3.2 explains the various steps involved in the approach of top –down costing.

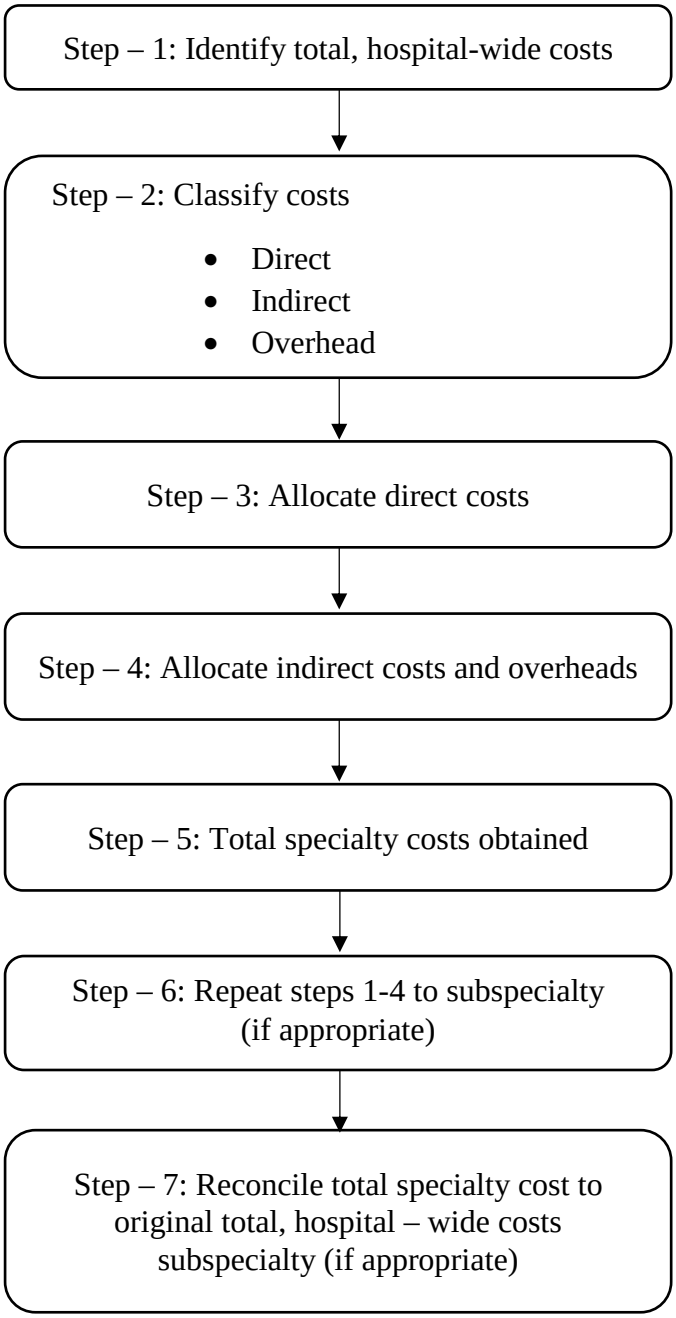

Fig.3.2: Basic Top – Down Costing

Source: (World Bank, 2009)

Bottom – up Costing

The patient based micro – costing model also referred to as bottom – up costing is another approach to costing. The stages are to:

1. Identify activity data
2. Establish clinical protocols for procedures or case mix-type group
3. Set the range of procedures to cost
4. Establish a cost profile for each procedure based on average resource consumption
5. Cost the input resources on the profile.
6. Reconcile total activity times cost to the hospital quantum.

Bottom –up costing is generally done on a specialty-by-specialty basis, with the specialty quantum of costs as the control total. This approach is justified not simply in terms of the "costing", but also because any price approach to micro-costing is flawed in the error of estimation in apportionment or allocation of costs to small volume activities are bound to be present in the process.

3.1.5 Overhead

Change in proportion of cost elements is rationale to the product or service it entangles. Taking a scenic view in these aspects, a high range of deviation is notable with overhead as an

element of cost over the past 20 years. Influence of labour has blurred recognition over these years due to the immense power of technology in its own form. Diminishing utility of labour is the consequence led by the clout of technology. The need with time conservancy automatically lead to the digitalized form of labour. An ongoing business stimulates the expenses into an established manner, dealing over a vibrant technology. They are indirect charges, the total absorption of indirect cost is clubbed under overhead.

3.1.6 Costing

A management philosophy, experimenting the elements of cost to build the amount to be stipulated is oriented with the behaviour of cost. In terms of variability, i.e. whether fixed, variable or semi-variable is adjacent to the time and nature. Drawing lines to create the cost through elements is dominated by the three elements of cost. The system of computing cost of production or of rising a business, by allocating expenditure to various stages of production or operation of firm.

3.1.7 Cost Management

Management of cost focuses on three aspects wise, .i.e. cost planning, cost implementation and cost control. Moreover, it is conclusive to the limits set, i.e. the mode of cost in nature, elements to be confined with and the costing triggers to be valued. As an initial stage, planning is the basics for management, similarly cost planning over an anticipated means to form the entire structure of

cost and to pertain the value of cost. Outlining the cost is essential step to be forwarded in cost management. Each element of cost is purely recognized as a separate unit in determining the final cost and in deriving the pursuit of cost. Drawing lines in and between the costs is deliberately conjoint to the cost management. The approaches and activities in planning and control decisions that improve the value of service and lowers the cost form. The process of planning and controlling the budget of business. A form of management accounting that allows business to predict impending expenditure to help reduce the chance of going over budget.

Most of the healthcare organizations continue to struggle with identifying the costs of products and services rendered by them, capturing the full cost of products and services, including inter-entity and departmental cost as part of full cost. The difficulties experience in allocation and absorption of costs are due to the integration of various interrelated process and inter-dependence of the process flowing from various service cost centers mutually. Imperative to hold the sound cost management strategies and technology healthcare service pricing requires a balance between the patients concern for affordability and industry's concern for adequate return on investment for growth and sustainability.

3.2 COST ACCOUNTING STANDARDS

The Institute of Cost Accountants of India, recognizing the need for structured approach to the measurement of cost in manufacture and service sector, to provide guidance to the user

organizations, government bodies, regulators, research agencies and academic institutions to achieve uniformity and consistency in classification, measurement and assignment of cost to product and services, has constituted Cost Accounting Standards Board (CASB) with the objective of formulating the Cost Accounting Standards. Formulation of CAS is comprehended to the usage of laws, business environment that prevails in the country.

The researcher has extended the study in evaluating the cost accounting standards applicable to the study and in revitalizing the cost description based on these standards.

3.2.1 CAS -1: Classification of Cost

Cost has been classified on the basis of nature of expenses and traceability. Accumulation of cost and discharging the expenses on this classification has form part of the study.

3.2.2 CAS -6: Material Cost

Assignment of material cost involves establishing a suitable procedure to identify and record the resources consumed by the cost object. Material costs shall be directly traced to a Cost object to the extent it is economically feasible and /or shall be assigned to the cost object on the basis of material quantity consumed or similar identifiable measure and valued as per the principles. All traceable costs to the extent possible for bringing the material up to the place of provider are to be reckoned.

3.2.3 CAS -10: Direct Expenses

Whether an item of expense is to be treated as direct expense or indirect expense, is to be determined in terms of materiality of an item. Materiality depends on the size and nature of item judged in particular circumstances. An item of expense is considered material if its omission could influence the economic decisions of users of the cost statement.

3.2.4 CAS -13: Cost of Service cost centre

Each identifiable service cost centre shall be treated as a distinct cost object for measurement of the cost of services subject to the principle of materiality. Cost of service cost centre shall be the aggregate of direct and indirect cost attributable to services being rendered by such cost centre.

The crux of traditional profit planning is based on how costs behave over range of volume level of activities. Detailing of cost is essentially remarkable to the fact that excessive detail will bog down the project and not provide any material benefit to its analysis. Too little detail will observe the meaningful results that could be achieved. Modern 7Cs' in cost management alike culture, competition, controls, compensation, change process, commitment, and continuous education have captured the business dynamism.

3.3 ACTIVITY BASED COSTING

Organizing and tracing the activities formulating the manufacture of a product or deliver a service is contagious to the

costing dignifies. Value addition to any product or service is through the inbuilt structure moulded. ABC initially deletes non-value added activities and formats only the value additional activities. An addition to an activity is highly equivalence to the relevance in structuring it. Cost objects consume activities in such the same way that activities consume resources. The actual level of activity performed to make products and serve consumers determines the quantity of flexible resources. ABC is related with the improvement in cycle time and quality. ABC increases management visibility into how product, consumers or supply channels consume work and resources. The benefit of implementing an ABC system closely matched the reasons for implementing an ABC system. Most firms initially focused on the cost data and planned to explore the possibility of implementing an activity based management system. Cost management requires a good understanding of how the total cost of a cost object changes as the cost drivers change. It is a system that focuses on activities as the fundamental cost objects and uses the cost of these activities for compiling the cost for the service. The service cost is built up from the cost of the specific activities undertaken to provide it.

The main concept in ABC involve: resources, activities, cost objects, resource drivers and cost drivers. The fundamental theory behind ABC is actually fairly easy to understand, this implies not all costs should be seen as products. The primary building materials of ABC is knowledge – Knowledge of the activities performed by the people and other resources employed by the organisation. The goal of ABC is not to allocate common costs

to products. The goal is to measure and price out all the resources used for activities that support the production and delivery of products and services to consumers. The factors impacting ABC include external environment, individual characteristic organizational factors, technical factors and task characteristics.

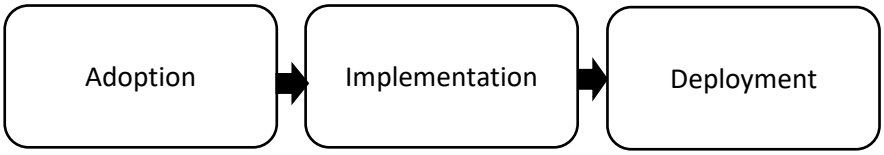

Fig.3.3: Stages of ABC

ABC developing stages involve : adoption - the decision making and planning process regarding quality, time and resource allocation for the project. It should be decided whether transforming into new system would be cost effective or not and whichset of application techniques and approaches would be most suited for the organizational context. Implementation - include the process of team organizaing, personnel acquiring and implementing the new system. Because of overlapping limitations and the neccessity of extending the existing classifications, deployment stage concludes the same. The final phase is related to the process of training, routinization, using and managing the new system.

Improved analytical capacity and causality principle of ABC is an approach to ascertain product cost more accurately. ABC is the most sophisticated way of allocation of overhead costs in the sense that it is consistent with the principle of causality. The

usefulness of ABC analysis can further be enhanced including a value analysis of every activity. An ABC model will enable us to analyze our product according to different consumer segments they are targeted at and compare the costs of each category with the premium and the buyer segment allow us to charge. Traditional cost methods group the general expenses (overhead cost) in the general cost centres such as those of production administration, disposal, services and research and distribution of these costs to the products, ABC categorizes them according to the activities that consume them. Infact, ABC analyses all the activities, providing information to the administration of the activities, whether these activities contribute less or cost more than they should, abolishing the non- value added.

ABC objectives are achieved through:

- Gauging the efficiency of different activity.
- Determination of non-value added activities.
- Attacking the area of cost redundancy.
- Ability to pin down the hidden cost.
- Determination of focal point for continuous improvement.

Comparing the traditional costing to ABC method; relied on the arbitrary addition of a proportion of overhead costs on to direct costs to attain the total cost. ABC avoids allocation or apportionment by turning indirect costs into direct cost. To eventually calculate the true cost i.e. measurable costs of the

resource items, the traditional approach to cost allocation relies on three basic aspects:

- Accumulate costs within a production or non- production department.
- Allocate non- production costs to production departments.
- Allocate the resulting production department costs to various products or services or consumers.

Activity management can reduce cost in four ways: activity elimination, activity selection, activity reduction and activity sharing.

Various limitations contradict the existence of ABC, involving:

- ABC is often a complex and relatively costly system to be implemented. This basically originates from the high insistence of ABC acquiring exact information related to the consumption rate of cost drivers.
- Some cost objects consume variable amount of cost and others, inherently consume variable amount of same type in a company.
- In manual production lines, unlike automotive, the consumption rate of cost drivers is often more variable and hence ABC is likely to be implemented.

- ABC is more of accounting nature.

ABC model can be used in decision making and strategy creation which would be used to guarantee long term success of the firm and help them gain the ability to react to the emerging trends in the markets.

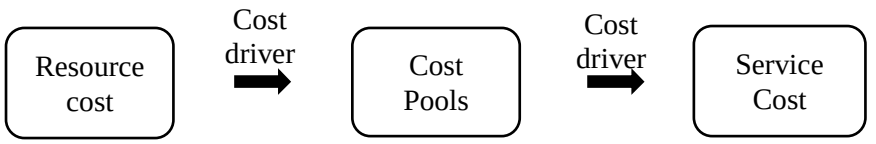

Fig.3.4: ABC model

- Resources (inputs): The basic elements within an organization that are consumed in the production of its services – in a manufacturing environment these "resources" include the things that comprise the product such as materials and labor Sarkis et al. (2006)[1].

- Activity: The most basic building block in the construction of an Activity Based Costing model is an activity. An activity is an event that causes the consumption of resources Brewer et.al (2010)[2] and, when viewed in the sequences in which they are performed, activities represent the basic actions that can be connected together to form a process Sarkis et al., (2006)[3].

- Activity measure: One unit of an activity is an "activity measure" and expresses how much of an activity is

performed; these measures are the basic units of the activity used to accumulate them into activity cost pools, and then assign them out to processes Brewer et al. (2010)[4].

- Activity cost pool: An activity cost pool is a collection of costs pertaining to a particular related set of activities; it is the "bucket" into which costs relating to a particular activity or closely related set of activities is accumulated Brewer et al (2010)[5]

- Cost drivers: Cost drivers are the elements that have a direct bearing to causing costs Kinney & Raiborn, (2009)[6]; they are the factors that determine the level of costs in a particular activity or process (e.g., more of a driver causes higher costs); in a manufacturing environment more production (the driver) would increase electricity costs, for instance Sarkis et al.(2006)[7].

- Process: A process is comprised of activities and any given entity (such as a manufacturing plant or a school) will have several. A process is a connected series of activities performed to create an output Kinney & Raiborn, (2009)[8]; a process can also be thought of as a path through a set of activities Euske et.al (1998)[9] that leads to an output.

- Cost objects (outputs): Cost objects are any product or service of an organization for which cost accumulations is desired – this is highly dependent upon the organization – in

a manufacturing environment a typical object would be one unit of output Sarkis et al. (2006)[10].

- Activity analysis: An activity analysis is the process of studying an organization's activities for the purpose of categorizing them and also to determine which are not adding value to the organization's purpose Kinney & Raiborn (2009)[11].

- Process map: A process map is a graphic representation – a detailed flowchart that depicts how activities are connected into processes and how processes, in turn, are connected to creating outputs Kinney & Raiborn, (2009)[12]; activities are combined together in a meaningful way to form processes Euske et al. (1998)[13]

3.3.1 Cost Centre:

Where cost is absorbed, the smallest segment of activity or area of responsibility for which costs are gathered.

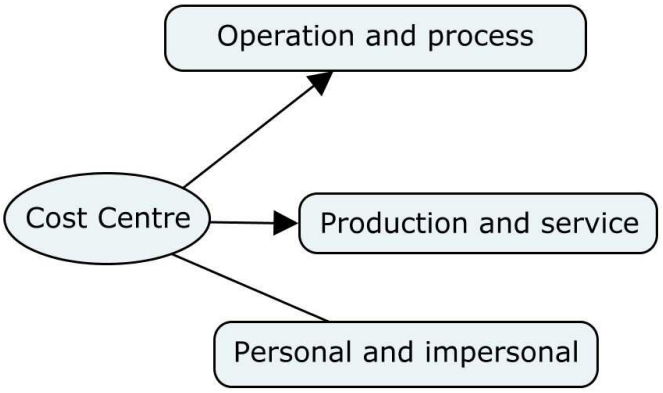

Fig.3.5: Types of cost centre

Cost Centre includes Billing, Information system Infection control, public relation, marketing, nursing department, payroll, security, dietary, and finance.

3.3.2 Revenue Centre:

Blood bank, cardiology, laboratory, pharmacy, radiology, operating room, emergency department, medical supplies, labor and delivery.

3.3.3 Responsibility Centre:

To achieve the goal of providing proper incentives.

Cost efficiency: Keeping costs low and being cost efficient provides an organization with a strong competitive advantage.

Kaplan's four stage cost model

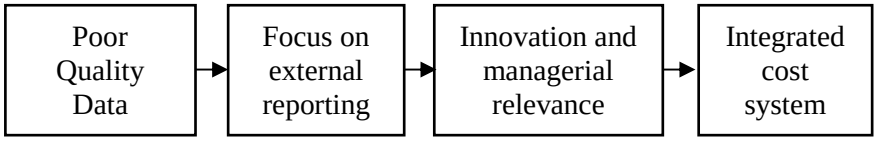

Fig.3.6: Cost Model

The basic concept that Kaplan explains is that it makes sense to have one cost accounting system to generate information for financial statements, another to collect cost information needed to motivate and evaluate managers, and third to use for making key management decisions. Furthermore, the cost model developed represents the relevance of cost arrangement in the sphere of business.

3.4 COST STRUCTURE

On the basis of cost elements i.e. material, labour and overhead, synchronizing cost to attain a fair view of absorption.

3.4.1 Cost Control

An execution action to eradicate activities which do not value the services and increase cost as a whole. A derivative of cost accounting, reflecting optimum utilization of resources or performing the same job at same cost and monetary limits on cost. A continuous comparison which aims to achieve targeted cost. The only way that the firms survive in the fierce competitive market is to control their costs which will eventually lead to an increase in profit margins. To meet the economic challenges faced by the industry, and to provide low-cost high quality services, healthcare organisation need to develop stringent control over their operations.

3.4.2 Cost Reduction

A permanent reduction in cost and evaluation of activities and resources that can reduce cost and value the performance of the services provided by the institution. The philosophy behind cost reduction is that no item of expenditure is in such an idle level as to preclude reduction. It may mean either (i) producing more at the existing level of expenditure. (ii) Producing at the existing level at reduced expenses.

3.4.3 Direct Cost

The cost that can be conveniently and economically traced directly to the cost pool or cost object.

3.4.4 Machinery

Include suction, quartery - diathermy, anesthesia workstation, boiling point apparatus, shadowless light, c-arm, laproscopy, microscope, OT table, air conditioner, pulse oximeter and multipara monitor etc. used in the hospitals.

3.4.5 Overhead

The cost which do not result from the existence of individual cost units in the hospitals. The indirect cost which has no convenient or economical trace from the cost to the cost pool or from the cost pool to the cost object.

3.4.6 Cost Management

The approaches and activities in planning and control decisions that improve the value of service and lower the cost. Control and reduction measures are part of the cost management definition.

3.4.7 Cost Awareness

The level of cost recognition within the organization. Whether cost is absorbed as a part of rational thinking or it’s unique to profit considered. The understanding capacity of the

hospital administration on the cost served through services rendered.

3.4.8 Cost Relevance

The extent of importance evaluated over the cost in the Hospital. Identification of the pertinence of cost along with the services served within the hospital.

3.4.9 Cost Allocation

Assigning positions for cost according to its nature, variability in occurrence and purpose. Distinguishing cost and charting them to the relevance attained. Identifying, aggregating and assigning cost to any cost object. Relying on the value perceived by the cost object i.e. the activity or item for which separate measurement is allocated. Mass of expense or the overhead formation is dissected with the traces of distribution it surrenders, assign cost more on the basis of rather arbitrary or even subjective rules.

3.4.10 Cost Appropriation

Proportionating common cost through understanding of its behavior, occurrence and estimated basis of benefits received. More precise in nature as assigning cost using rules based on factors such as actual wage or consumption. Lump sum amount is dived with the clear cut measurable fact.

3.4.11 Cost Planning

An initial stage in cost management cycle, designing of cost in improving quality and performance of service. Forecasting of cost, department wise or on historical basis to meet the requirements of efficient utilization.

3.4.12 Cost Classification

Generalization of the cost as per its variability, segregation under certain norms which are exclusive to its importance in the hospital management.

3.4.13 Cost Estimation

The approximation of cost for a particular service, department and rating of cost according to the importance of service. Analyzing the cost behaviour to eventually track the planned sketch of cost with its determinants.

3.4.14 Cost Conscious

To evaluate the extend of responsiveness towards cost and whether keen in organizing hospital services.

3.4.15 Cost Sensitive

Sensible to the values in cost and any deviation in cost simultaneously effects the performance of activities.

3.4.16 Responsibility Centre

Subunits of an organization for which authority and responsibility is sorted. Revenue and cost information are reported on the basis of responsibility allocated to these centres.

3.4.17 Alternative Material

Substituting materials by regulating its quality and maintaining the predetermined values in services.

3.4.18 Bulk Purchase

Framing out a larger purchase so as to make use of discounts and reduce cost on an overall basis. Bulk purchase is a cost reduction technique.

3.4.19 Outsourcing

The practice of having certain job functions done outside an organization instead of in-house department. The main advantages include cost saving, focus on core business, consumer satisfaction and operational efficiency. A business practice in which certain functions required by the business are performed by outside parties on a contract basis rather than the business's employees. Hospitals often entertain security services, canteen and housekeeping in this category.

3.4.20 Alternative Labour

Substituting the employment array with outsourcing and other means by regulating its quality and maintaining the predetermined values in services.

3.4.21 Value Engineering

A technique designed to examine the cost of a service and to determine whether elimination is possible keeping all other aspects including functions, quality and performance in a sustainable manner. According to Lawrence D Miles, it involves a study of the characteristics cost of an item namely design, methods of manufacture, quality etc. with the objective of reducing the cost of production. It is the study of designs and systems prior to the rendering of services for the purpose of achieving essential functions at the lowest life cycle cost consistent with required performance, quality, reliability and safety.

3.4.22 Value Analysis

A systematic application of established techniques to identify the functions of a product or component and to provide the desired functions at the lowest total cost. It is a creative approach to eliminate unnecessary costs which add neither to quality nor to the appearance of the product.

3.4.23 Medical Services

Departments which generates income directly from the patients are called medical departments. Examples: Consultation Service, Gynecology Service, Surgical Service etc.

3.4.24 Medical Support Service

These services generally support medical services. These may also generate revenue from Patients directly. Examples: Laboratory Services, Radiology Services, Blood Bank Services etc.

3.4.25 Non-Medical Support Services

Those services which do not generate income directly but supports the medical and medical support services to do their services effectively are known as non- medical support services. Examples: Finance and Accounts, Housekeeping, Admission, Medical Records etc.

3.4.26 Outpatient Care

Output patient care is medical department provided on an outpatient basis including diagnosis, observation, consultation, treatment, intervention and rehabilitation series. This care can include advanced medical technology and procedure even when provided outside the hospitals.

3.4.27 Quality

There are two types of service quality – technical and functional. Technical quality refers to the delivery care services or their outcomes (i.e. what is offered and received), while functional

quality refers to the healthcare services delivery process or the way in which the consumer receives the service (i.e. how the service is offered and received)

3.4.28 Cost Driver

The level of activity or volume that causally affects cost over a given time span. There is a cause and effect relationship between a change in the level of activity or volume and a change in the level of total cost. A variable, such as the level of activity or volume, that causally affects cost over a given time span.

3.4.29 Doctors

Most profit maximizing organizations however emphasize technical rationality and quantitative efficiency. There are three categories of doctors namely; Empanelled Doctors, Retainers and Salaried Doctors.

- Empanelled doctors- are visiting doctors at each facility and they get a share of the doctors' fee in the surgeries performed.

- Salaried Doctors (on payroll) - At this unit are the fresh MBBS and MDS with little or no experience. They are regular, full-time employees who get salary and other fringe benefits each month.

- Retainers- get a lump sum amount and are not entitled to benefits such as leaves, medical reimbursement, provident fund etc. Majority of the doctors are retainers who work on

a retainer ship fee instead of a salary or any other kind of revenue sharing arrangement.

There are star doctors who can be on retainer ship or be empanelled with their own revenue – sharing model. They are responsible for attracting patients to the hospital owing to their reputation in the medical field. There are some widely recognized doctors who are the ‘rain makers’ of the organizations. They are chief revenue generators and several patients come owing to the fame of these ‘doctors’. The recruitment for the doctors of all categories is mainly through referrals from senior doctors and poaching of reputed doctors from other hospitals.

3.5 HEALTHCARE

Health is man’s natural prerequisite and it is the result off living in accordance with natural laws pertaining to body, mind and environment. The World Health Organisation (WHO) defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Healthcare management is defined as multitude of services rendered to individuals, families or communities by the agents of the health services or profession, for the purpose of promoting good health.

The efficient goal for any health care system is to touch and enrich billion lives with creating certain set of value i.e. Patient Centricity, Ownership and integrity to patients. Equitable in healthcare is measured through the terms of patient outcomes

achieved per rupee expended. The true status matters the worthwhile of healthcare service. Healthcare industry is described as a lifeline industry whose service cannot be replaced or substituted. The industry is a core sector, always regarded as a noble service because it deals with human life which is precious.

Healthcare costs are continuously spiraling up and hospitals are facing steep competition to provide increased ease to high quality service.

Medical care ranges from domiciliary care to resident hospital care and it refers chiefly to those personal services that are provided directly by the physicians or rendered under their instructions. Best healthcare is conditioned from womb to tomb with effective deployment of available resources. Bending the cost curve that is initiating cost control and reduction is widely spontaneous. The hospital usually feel difficulties to allocate the cost of stand-by facilities such as generator, backup operation theatre and extra trained staff. They charge these cost to each patient, which is overloading the price.

3.6 CONCLUSION

An in-depth view is countered to the medical and medical support services in its utmost generalized form. The sketch to randomly notify the advancement in medical science and the healthcare costing system is summarized in a crystalized form with the purview of costing facets. Criteria to fulfill the instant need of

cost is measured with sacrifice made not only in figures, but also as a means of qualitative configurations.

Costing not only summarizes the expenses marked but also lines out the intact value that surrounds its existence. Managing is a needful tool which fulfills control and reduction controversies in its adaptable form. To trigger the perceived value of medical ailment and pinpoint the outrageous expenses which often rule out the entire price figured, brings forth better managing technique to monitor the current status of cost to service. Transparency in cost management needs to be questionable in the current healthcare costing structure. Among the most under polished procedures cost management has also placed its position in large. Both the private sector and public sector need an esteem evaluation in the services provided thereon. Hospitals whether valued as Specialty or Super-specialty or Multispecialty or the general hospitals need to idealize the cost pertained on the value of their services. Category does not rename their cost valuation rather the transparency can be synchronized with a good set of factors. Identifying and evaluating these major and minor elements of cost is highly volatile with the manpower and technology that is established.

Kerala being charmed by the best professionals is also drained by the cost that consumes the professionals; the anarchy of cost elements is highly subjected in these services. The study notches in terms of costing purview.

Reference

1. Sarkis, J., Meade, l. and Presley, A. (2006). An Activity Based Management Methodology for Evaluating Business, *Business Process Management Journal*, 12(6),751-769 ·
2. Brewer, P. C., Garrison, R. H. and Noreen, E. W.(2008). *Managerial Accounting*(12th ed.). New York: McGraw-Hill Irwin.
3. Op. Cit.1.
4. Op. Cit.2.
5. Ibid
6. Kinney, M. R. and Raiborn, C. A. (2009). *Cost accounting: Foundations and evolutions Mason*, OH: Thomson South-Western.
7. Op. Cit. 3
8. Op. Cit. 6
9. Euske, K. J., Frause, N., Peck, T., Rosenstiel, B., & Schreck, S. (1998). *Service process measurement: Breaking the code*. Bedford, TX: CAM-I.
10. Op. Cit. 7
11. Op. Cit. 8
12. Ibid.
13. Op. Cit. 9

Chapter IV

HEALTHCARE SERVICE PRICE SENSITIVITY AND COST STRUCTURE ANALYSIS OF HOSPITAL SECTOR IN KERALA

Healthcare is the most difficult, chaotic, and complex industry to manage today and the hospital is altogether the most complex human organization ever devised.

– Peter Drucker

Market texture has very close relation to its consumers. An imperfectly competitive market has its demand inversely related to its price, in other words, price rules the services obtained. This chapter has been divided into two parts. Part – A examines the level of price sensitivity among patients towards the hospital services and cost consciousness of the hospital. Literally, the price sensitivity of the hospital has been termed as cost consciousness of the hospital. The study has been categorized from both the perspective i.e. institutional and patient. Part – B delve into the cost structure analysis of the hospital. The researcher summarizes that cost consciousness of the hospital rebuilds the cost structure for the healthcare services. Furthermore, cost conscious hospital would indulge in much better analysis of its cost structure.

4.1 Part - A: Patients' price sensitivity and Hospitals' cost consciousness towards healthcare services.

Price sensitivity can basically be defined as being the extent to which demand changes when the price for a service changes. The price sensitivity of a service varies with the level of importance consumers place on price relative to other purchasing criteria. Some people may value quality over price, making them less susceptible to price sensitivity. People who are more sensitive to price means a slight change in price affects their purchasing attitude. Price sensitivity places a premium on understanding the competition, the buying process, and the uniqueness of the services in the marketplace. For example, consumers have lower price sensitivity if a service is unique or has few substitutes.

Price Sensitivity in Economics

In economics, price sensitivity is commonly referred as changes in demand based on changes in price. When price increases demand decreases and vice versa. It is measured using the price elasticity of demand, or the measure of the change in demand based on its price change. The law of demand states that if all other market factors remain constant, a relative price increase leads to a drop in the quantity demanded. This law is violated in case of giffen goods, where a product is consumed more as of price increase and vice versa. It is also known as giffen paradox.

High elasticity means consumers are highly responsive to price changes. Inelastic demand have lower responsiveness to changes in price. Price sensitivity can be defined as the degree to which consumers' behaviors are affected by the price of the product or service. Price sensitivity is also known as price elasticity of demand and this means the extent to which a particular service provided is affected.

Consumers are less sensitive to price when the total cost is low compared to their total income. Likewise, the total expenditure compared to the total cost of the end product affects price sensitivity. Another way of explaining price sensitivity is, "the consumer demand for a service is changed by the cost of the service". It basically helps the providers' study the consumer behavior and assists them in making good decisions about the service. The level of price sensitivity varies depending on various services and consumers. In other words, a price sensitive consumer is cost conscious. Cost when summarized is the benefit received for the sacrifices made, quantified with the obtained value of service. Price conscious consumer choice is a cornerstone of market oriented healthcare reform and the purchasing strategies used.

Price Sensitivity in Marketing

Pricing policy turns to be one of the keystone of marketing strategy. The constellation of preferences place hold in rendering a service. Consumer demand rate is price sensitivity and depends on

the gap between the sales price and the reference price in consumers' mind. Analyzing price sensitivity is highly useful in attempts to determine the impact created by the actual outcome of a specific variable, if it is different from what has been assumed previously. Pricing is a key determinant for any marketing activity. Inducement of advertisement, colourful media and challenging substitutes have made allocation of money towards hospital services a bigger challenge. Various pricing mechanisms including price signaling, price skimming, penetrating price, price bundling etc. add value to the marketing technique. The key to price sensitivity is the availability of substitutes. Marketing nourishes the empire of hospital services reallocating quality and price. Berry and Yadav (1996)[1] In essence the ability to charge a particular price is a barometer that determines and confirms the success of determining decision such a branding, positioning and communicating the competitive advantage of the service provided.

Consumers are less price sensitive if they are not aware of or if there is few substitution. This wholesome approach has been shattered by the tremendous domination of healthcare facility. Various factors determine the degree of price comparison and switchover which are terminals of price sensitivity. Comparing the price for various medical services and contrasting with the requirement is a trend originated with sensitivity in healthcare. The transparency in available facilities contribute to the track of scrutinizing the need and figure. Comfortability, quality,

convenience are among the supporting elements that withstand the satisfaction level of medical ailment. A detailed analysis on the financial aspects is an insight in the reform of healthcare facilities.Items which are commoditized will usually exhibit higher price elasticity, i.e. a small change in price will lead to a large change in the quantity demanded. Items which are inelastic, however, are defined to be those where a large change in price leads to a small change in the quantity demanded. In general, the price sensitivity of consumers are a function of:

Purchasing power: People with fixed or low levels of income will usually exhibit higher price sensitivity.

Nature of the service: If the service is a commodity (i.e., is easily available and not much differentiated), it will usually exhibit higher price sensitivity.

Market structure: Characteristics of a market design the competition and pricing policy. Competitive market prove relevance to pricing mechanism through the determinants in the market. A perfect competition market structure involves large sellers and buyers engaged in selling and buying of homogenous products at a single prevailing price. Whereas in case of monopolistic competition market structure, there are large sellers selling the products that are similar and compete with each other on factor other than price. For an oligopoly market, is characterised by few sellers selling homogenous product, with more of control on

price. A market structure with single seller selling a product with no close substitutes and has price control, known as Monopoly market is yet another confined market structure domination.

Regulatory policy: Government restrictions on price that can be charged in the market. Furthermore, Government takes steps to control and regulate the pricing mechanism in the market.

Price Sensitivity in Cost Management

In hospital cost management, price sensitivity is the consciousness of the patients' towards the cost windows or range dealing with. Competition value of the services also substantiate the price sensitivity of patients in the literal form of cost management, as they can negotiate to a greater extend in this context. It is important for the hospitals to be highly cost consciousness in case the patients' are significantly price sensitive towards the hospital services. Making fruitful strategies and positively analysing cost is an important challenge faced by a hospital in a highly competitive market.

4.1.1 PATIENTS' POINT OF VIEW

Mushroomed across the country, hospitals in totality have vented a fog of innovations. Precisely these have administered the quality of various facilities to the quantum of money expended. One of the major difficulties in health care is that the product is often complex, the outcome unclear and information about price, quality and effectiveness is hard to find and interpret.

Price for all factors is the value or worth enjoyed by a patient. Moreover, from a patient's perspective the sacrifice made for the benefit received, price rather being the cost of service. Unlike manpower, equipment or supplier, money is not a tangible resource, it is with a cost or a potential benefit.

To be responsive towards price is countered with the affordability of a patient. To value a service in quantum to the money dispensed has a linear relationship with the ability to pay. Demand for a hospital service when shifted with the change in price is relative to the affordability. Switching plan explains the ability and willingness to pay. Understanding how price elasticity varies with consumer characteristics is important for evaluating the potential of market oriented health services. Price elasticity reflects the income or disposable income which is undefined.

The patient's perception about a hospital service and the actual service received deals with the feeling of mismatch in satisfaction and the price being charged. Evaluating various substitute in terms of patient's affordability and the ease of benefit received. These ultimately rise into a situation of price sensitiveness. The dependency on price comparison adhere to the willingness to pay and affordability.

This part of the chapter analyses the sample of 450 patients for the patient perspective and 90 hospitals for institutional perspective, chosen for evaluating the price sensitiveness. The detail of sample frame is as explained elsewhere.

4.1.1.1 Aggregate Price Sensitiveness - Patient Views:

Selected patients were asked about the hospital price sensitiveness through an interview schedule as discussed in the methodology part and the result is tabulated and presented in Table 4.1 given below.

Table 4.1: *Aggregate Patients' Price Sensitiveness*

FACTOR	Aggregate Score
Detailed price analysis for choosing the hospital service	4.70 (0.66)
Charged more for the hospital service	2.65 (1.76)
Price Sensitivity Rating	4.80 (0.67)
Price Comparison	4.58 (0.83)
AGGREGATE	**4.18 (1.03)**

*Figures in brackets are the standard deviation.

Above Table 4.1, shows the aggregate patients' price sensitiveness towards Modern Science hospital services. Various factors analyzed reveals that the aggregate mean score for price sensitiveness among the patients is 4.18 out of 5 (83.6%). Furthermore, it reveals that the price comparison for the service as a part of choosing the hospital has a mean score of 4.58 (91.6%). This concludes that the patients have higher price sensitivity of 83.6% towards Modern Science hospital services.

4.1.1.2 Hospital type wise classification of patients' price sensitivity

The aggregate data on patients' price sensitivity have been classified hospital wise and presented in Table 4.2 given below:

Table 4.2: *Distribution of Sample means on the basis of type of the hospitals*

TYPE / FACTOR	General	Multi/ Super	Aggregate Score	t Test (p value)
Detailed price analysis for choosing the hospital service	4.83 (0.50)	4.64 (0.71)	4.70 (0.66)	.001**
Charged more for the hospital service	2.34 (1.75)	2.80 (1.74)	2.65 (1.76)	.008**
Price Sensitivity Rating	4.82 (0.61)	4.78 (0.70)	4.80 (0.67)	.584
Price Comparison	4.73 (0.68)	4.51 (0.88)	4.58 (0.83)	.003**
AGGREGATE	**4.18 (1.23)**	**4.18 (0.92)**	**4.18 (1.03)**	**.998**

*Figures in brackets are the standard deviation.
** Significant at 5%level

It can be noticed from the above Table 4.2 that the aggregate mean score of patients' price sensitivity of both General hospitals and Multi-specialty hospitals are 4.18 out of 5 (83.6%). Focusing the price sensitivity ratings, it can be observed that the mean score is 4.82 for the General hospital patients as compared to the Multi-specialty hospital patients' with a mean score of 4.78. Price comparison by the patients in case of General hospital and Multi-specialty hospital shows a mean score are 4.73 and 4.51, respectively.

The aggregate mean difference in the price sensitivity score and between General and Multi-specialty hospital are not statistically significant, for 't' test at 5 per cent significant level as the 'p value' is above 0.05. Regarding price analysis and price comparison the mean scores differences are statistically significant.

Further conceptualizing the fact that, in case of analysis of patients' price sensitivity on the basis of hospital type, there is a substantial sensitiveness taking into consideration various factors analysed for price sensitivity.

4.1.1.3 Gender based classification of patients' price sensitivity

Below Table 4.3 classifies the aggregate data according to gender wise classification of the sample respondents.

Table 4.3: *Distribution of Sample Respondents on the basis of gender*

GENDER / FACTOR	Female	Male	Aggregate Score	t Test (p value)
Detailed price analysis for choosing the hospital service	4.73 (0.66)	4.67 (0.65)	4.70 (0.66)	.357
Charged more for the service	2.52 (1.74)	2.77 (1.77)	2.65 (1.76)	.140
Price Sensitivity Rating	4.81 (0.62)	4.78 (0.71)	4.80 (0.67)	.616
Price Comparison	4.51 (0.89)	4.65 (0.77)	4.58 (0.83)	.091
AGGREGATE	**4.14 (1.09)**	**4.22 (0.97)**	**4.18 (1.03)**	**.921**

*Figures in brackets are the standard deviation.

It can be observed from the Table 4.3, that female respondents are less price sensitive as compared to male respondents with a mean score of 4.14 (82.8%) and 4.22 (84.4%), respectively. Moreover, price comparison and rating of price sensitivity is highly positive among male respondents as compared to female respondents.

Analyzing the aggregate variation among the respondents gender wise, using t Test statistically, it does not prove significant difference at 5 % level, with a 'p value' more than 0.05.On the basis of gender classification, it can be concluded that there is no evidential price sensitivity among the patients.

4.1.1.4 Place of residence based classification of patients' price sensitivity

In order to understand whether there is any difference in the price sensitivity based on place of residence i.e. rural, semi-urban and urban, the above data has been classified on the basis of place of residence of the respondents and presented in the Table 4.4.

Table 4.4: *Distribution of Sample Respondents on the basis of place of residence*

PLACE OF RESIDENCE / FACTOR	Rural	Semi – urban	Urban	Aggregate Score	ANOVA (p value)
Detailed price analysis for choosing the hospital service	4.71 (0.69)	4.72 (0.62)	4.38 (0.82)	4.70 (0.66)	.043**
Charged more for the service	2.52 (1.79)	2.66 (1.74)	3.08 (1.79)	2.65 (1.76)	.358
Price Sensitivity Rating	4.76 (0.77)	4.81 (0.62)	4.75 (0.85)	4.80 (0.67)	.709
Price Comparison	4.62 (0.83)	4.58 (0.83)	4.42 (0.88)	4.58 (0.83)	.548
AGGREGATE	**4.15 (1.09)**	**4.19 (1.03)**	**4.16 (0.74)**	**4.18 (1.03)**	**.998**

*Figures in brackets are the standard deviation.
** Significant at 5%level

It can be noticed from the table that the patients availing hospital services from semi - urban area are potentially more price sensitive with a mean score of 4.19 as compared to that of the rural and urban areas, having a mean score of 4.15, and 4.16 respectively. Moreover, the factor like detailed price analysis shows a higher mean score among the patients' from semi - urban sector as compared to urban sector, with a mean score of 4.72 and 4.38 respectively.

To analyze the variance between the respondents from rural, semi-urban and urban area, One-way ANOVA is used, which proved that there is no significant difference at 5% level of significance, with a 'p value' more than 0.05.Whereas, in case of variation regarding the factor, detailed price analysis for choosing the hospital, it is proved significant at 5% level of significance, with a 'p value' more than 0.05.

This further pinpoints that, in case of the classification place of residence, patients' price sensitivity is noticeable in certain factor for consideration.

4.1.1.5 Pair wise analysis of patients' price sensitivity based on place of residence

A further analysis of price sensitivity is made to understand where areas are similar and dissimilar in this respect. For this purpose, Post Hoc Test is carried out and the result is presented in Table 4.5.

Table 4.5: *Post Hoc Test (Tukey HSD)*

Dependent Variable	(I) Residence	(J) Residence	Mean Difference (I-J)	Std. Error	Sig.
Detailed	Urban	Semi Urban	-.346*	.138	.034*
		Rural	-.337	.147	.057
	Semi Urban	Urban	.346*	.138	.034*
		Rural	.009	.072	.992
	Rural	Urban	.337	.147	.057
		Semi Urban	-.009	.072	.992

*. The mean difference is significant at the 0.05 level.

In the Table 4.5, Post Hoc comparisons evaluates pairwise differences among the group means using Tukey HSD test since equal variances were tenable. Tests revealed significant pairwise differences between the mean score for the factor-detailed analysis for choosing a hospital service between the patients from urban and semi – urban sector with the 'p value' less than 0.05. Moreover, the comparison with the same factor for the area between the rural and semi – urban is not significantly different as the 'p value' establishes a more than 0.05 value. This further illustrates that there is a visible price sensitivity factor wise analyzing the categories of hospitals on the basis of place of residence.

4.1.1.6 Hospital ownership pattern based classification of patients' price sensitivity

In order to understand the patients' availing services from which type of hospital are more price sensitive, the relevant data

have been classified on the basis of ownership pattern of hospital and presented in the Table 4.6 below:

Table 4.6: *Distribution of Sample means of price sensitivity on the basis of ownership pattern*

OWNERSHIP PATTERN / FACTOR	Sole Proprietor (Medical)	Sole Proprietor (Non – Medical)	Partnership	Company	Trust	Aggregate Score	ANOVA (p value)
Detailed price analysis for choosing the hospital service	4.81 (0.42)	4.80 (0.45)	4.76 (0.62)	4.55 (0.82)	4.75 (0.55)	**4.70 (0.66)**	.014
Charged more for the service	2.77 (1.78)	2.40 (1.95)	2.77 (1.74)	2.85 (1.78)	2.01 (1.59)	**2.65 (1.76)**	.006**
Price Sensitivity Rating	4.82 (0.60)	4.80 (0.45)	4.92 (0.43)	4.74 (0.81)	4.72 (0.73)	**4.80 (0.67)**	.185
Price Comparison	4.73 (0.64)	4.80 (0.45)	4.60 (0.74)	4.39 (1.03)	4.72 (0.68)	**4.58 (0.83)**	.008**
AGGREGATE	**4.28 (1.01)**	**4.20 (1.20)**	**4.26 (1.00)**	**4.13 (0.87)**	**4.05 (1.36)**	**4.18 (1.03)**	**.998**

*Figures in brackets are the standard deviation.
** Significant at 5%level

Above table displays patients' price sensitiveness on the basis of hospital ownership pattern. The patients availing services from hospitals with an ownership of trust has least mean score of 4.05 as compared to the ownership pattern of Sole Proprietorship (medical), Sole Proprietorship (Non - Medical), Partnership, and Company with a mean score of 4.28, 4.20, 4.26 and 4.13 respectively in case of aggregate response.

For analyzing whether these variations between the different factors and the ownership pattern is significant statistically, One-way ANOVA is used. It further proved that the patients feeling charged more for the service and price comparison before attaining the service shows a significant difference at 5 % level, with a ‘p value’ less than 0.05. This further illustrates that there is a visible price sensitivity factor wise analyzing the categories of hospitals on the basis of ownership.

4.1.1.7 Pair wise analysis of price sensitivity of patients based on ownership pattern

It is made to infer further whether the price sensitivity of the patients based on ownership pattern are similar or dissimilar in the following analysis. For this purpose, Post Hoc Test is carried out and the result is presented below:

Table 4.7: *Post Hoc (Tukey HSD)*

Dependent Variable	(I) Ownership	(J) Ownership	Mean Difference (I-J)	Std. Error	Sig.
Charged	Trust	Sole Medical	-.055	.096	.979
		Sole Non-Medical	-.047	.298	1.000
		Partnership	-.011	.094	1.000
		Company	.203	.088	.143
	Sole Medical	Sole Non-Medical	.368	.796	.991
		Partnership	-.005	.240	1.000
		Company	-.080	.224	.997
		Trust	.756*	.257	.028*
	Sole Non-Medical	Sole Medical	-.368	.796	.991
		Partnership	-.373	.794	.990
		Company	-.448	.789	.980
		Trust	.388	.799	.989
	Partnership	Sole Medical	.005	.240	1.000
		Sole Non-Medical	.373	.794	.990
		Company	-.075	.218	.997
		Trust	.761*	.251	.021*
	Company	Sole Medical	.080	.224	.997
		Sole Non-Medical	.448	.789	.980
		Partnership	.075	.218	.997
		Trust	.836*	.235	.004*
	Trust	Sole Medical	-.756*	.257	.028*
		Sole Non-Medical	-.388	.799	.989
		Partnership	-.761*	.251	.021*
		Company	-.836*	.235	.004*
Comparison	Sole Medical	Sole Non-Medical	-.073	.376	1.000
		Partnership	.127	.114	.797
		Company	.337*	.106	.014*
		Trust	.010	.121	1.000

Dependent Variable	(I) Ownership	(J) Ownership	Mean Difference (I-J)	Std. Error	Sig.
	Sole Non-Medical	Sole Medical	.073	.376	1.000
		Partnership	.200	.375	.984
		Company	.409	.373	.808
		Trust	.082	.378	.999
	Partnership	Sole Medical	-.127	.114	.797
		Sole Non-Medical	-.200	.375	.984
		Company	.209	.103	.252
		Trust	-.118	.119	.859
	Company	Sole Medical	-.337*	.106	.014*
		Sole Non-Medical	-.409	.373	.808
		Partnership	-.209	.103	.252
		Trust	-.327*	.111	.029*
	Trust	Sole Medical	-.010	.121	1.000
		Sole Non-Medical	-.082	.378	.999
		Partnership	.118	.119	.859
		Company	.327*	.111	.029*

Table 4.7 Post Hoc comparisons evaluates pairwise differences among the group means using Tukey HSD test since equal variances were tenable. Tests revealed significant pairwise differences between the mean score for the factor charged more for the service and price comparison between the patients' visiting urban sector with the 'p value' less than 0.05, significant at 5% level. Moreover, the comparison with the same factor for the area between the rural and semi – urban is not significantly different as the 'p value' establishes more than 0.05.

4.1.1.8 Age group wise classification of patients' price sensitivity

In order to understand age with variation in the patients' price sensitivity, the relevant data has been classified on the basis of age of the respondent and presented in the Table 4.8:

Table 4.8: *Distribution of Sample Respondents on the basis of age group*

AGE GROUP / FACTOR	15 to 24 years	25 to 44 years	45 to 64 years	65 above	**Aggregate Score**	**ANOVA (p value)**
Detailed price analysis for choosing the hospital service	4.70 (0.67)	4.73 (0.61)	4.67 (0.67)	1.33 (0.44)	**4.70 (0.66)**	.691
Charged more for the service	2.78 (1.85)	2.53 (1.74)	2.79 (1.77)	2.56 (1.88)	**2.65 (1.76)**	.526
Price Sensitivity Rating	4.78 (0.64)	4.81 (0.62)	4.79 (0.69)	4.56 (1.33)	**4.80 (0.67)**	.843
Price Comparison	4.59 (0.80)	4.62 (0.76)	4.54 (0.90)	4.33 (1.32)	**4.58 (0.83)**	.715
AGGREGATE	**4.21 (0.96)**	**4.17 (1.10)**	**4.20 (0.94)**	**3.20 (1.53)**	**4.18 (1.03)**	**.545**

*Figures in brackets are the standard deviation.

Above Table 4.8 reveals patients' price sensitiveness on the basis of patients' age group. The patients' in the age group 15 to 24 years shows a high mean score of 4.21(84%) as compared to patients' in the age group of 65 and above having a mean score of 3.20 (64%). Similarly, the price comparison shows a high mean score of 4.62 for the age group of 25 to 44 years as compared to the least score of 4.33 for the age group above 65 years.

Furthermore, an analysis is statistically carried out using One-way ANOVA to verify the variations, which further proved that there is no significant difference between the patients' ages groups and the aggregate price sensitivity at 5 % level of significance, with a 'p value' more than 0.05. This pinpoints that there is no visible price sensitivity categorizing the hospitals on the basis of age group.

From the forgoing analysis, it can be concluded that patients are highly price sensitive towards Modern hospital services. The aggregate average sensitivity is 83.6%. Most of the patients go for detailed price analysis for choosing the hospital, price sensitivity rating and price comparison. No marked difference is seen in this respect between gender, place of residence, type of hospital, ownership pattern of hospial and age group.

4.1.2 HOSPITAL MANAGEMENT POINT OF VIEW

In order to have a deeper understanding of the price sensitivity in this sector, in addition to the patients' view, the hospital management view point were also collected and analysed. For the hospital point of view, it is analysed on the basis of cost consciousness. Three statements related to this aspect were included in the interview schedule and scored in a 7 point scale.

4.1.2.1 Aggregate Cost Consciousness – Hospital View

Hospitals selected were inquired about the patients' cost consciousness through an interview schedule as discussed in the

methodology part and the result is tabulated and presented in Table 4.9 given below.

Table 4.9: *Aggregate Cost Consciousness of hospitals*

Factor	Aggregate Score
Consumer Complaint on pricing of services	4.28 (2.02)
Priority for patient's price sensitivity	6.30 (1.07)
Affect due to change in price	5.60 (1.54)
AGGREGATE	**5.39 (1.03)**

*Figures in brackets are the standard deviation.

It can be noticed from the table that the aggregate mean score is 5.39 out of 7 as a relative of 77%. The factors considered include consumer complaint on pricing of services which scores 4.28, priority for patients' price sensitivity scores 6.3 and the affect due to change in price stands 5.6 as against a maximum score of 7. This indicates that there is a higher level of cost consciousness among the hospital management.

4.1.2.2 Hospital type wise classification of hospital management view about cost consciousness towards hospital services

The data relating to the cost consciousness towards hospital services have been arranged on the basis of hospital type wise and presented in the Table 4.10 below.

Table 4.10: *Distribution of Modern Science hospitals on the basis of type of hospitals*

Type / Factors	General	Multi	Aggregate Score	t Test (p-Value)
Consumer Complaint on pricing of services	4.71 (1.94)	4.12 (2.03)	4.28 (2.02)	.224
Priority for patient's price sensitivity	6.33 (1.34)	6.29 (0.96)	6.30 (1.07)	.859
Business affecting due to change in price	5.88 (1.80)	5.50 (1.43)	5.60 (1.54)	.308
AGGREGATE	**5.64 (0.84)**	**5.30 (1.10)**	**5.39 (1.03)**	**.694**

*Figures in brackets are the standard deviation.

From the table it can be seen that the aggregate score for all the three statements put together, the General hospital shows a mean score of 5.64 and Multi – specialty hospital with 5.30 as against a maximum score of 7. Statement wise mean score for all the three statement in this respect shows that general hospital has higher mean score than multi-specialty hospital.

However, the mean difference are not statistically significant as the 'p value' for t Test is higher than 0.05 at 5 % level.

4.1.2.3 Bed capacity wise classification of hospital management view about cost consciousness of hospital services

In order to understand the management perception about patients' cost consciousness among hospital of different bed size, the aggregate data have been classified on the basis of bed size and presented in Table 4.11.

Table 4.11: *Distribution of Modern Science hospitals on the basis of bed capacity*

BED SIZE / FACTORS	Up to 100 Beds	101 – 300 Beds	301 – 500 Beds	501 and above Beds	Aggregate Score	ANOVA (p-value)
Consumer Complaint on pricing of services	4.78 (1.94)	4.03 (1.85)	3.08 (2.10)	4.50 (3.54)	4.28 (2.02)	.047**
Priority for patient's price sensitivity	6.40 (1.19)	6.47 (0.57)	5.92 (1.12)	4.00 (1.41)	6.30 (1.07)	.006**
Affect due to change in price	5.96 (1.54)	5.50 (1.33)	4.92 (1.66)	3.50 (0.71)	5.60 (1.54)	.029**
AGGREGATE	**5.71 (0.84)**	**5.33 (1.23)**	**4.64 (1.44)**	**4.00 (0.50)**	**5.39 (1.03)**	**.342**

*Figures in brackets are the standard deviation.
**Significant at 5% level.

It can be observed from the table that aggregate mean score of all the three statements relating to cost consciousness put together has highest in hospitals with up to 100 bed size (5.71) followed by hospitals with a bed size 101 – 300 bed size (5.33). It is lowest among the hospitals with 501 and above bed size (4.00).

Statement wise also more or less similar pattern is seen among hospitals with different bed size. For all the three statement the mean value is higher on hospitals with up to 100 bed size and lowest in hospitals with more than 500 bed size hospital.

The aggregate mean difference is not statistically significant as the ‘p value’ of One-way ANOVA for the above is 0.05 at 5% level. But, the differences are statistically significant for factor wise consideration of price sensitivity, as the ‘p value’ for One-way ANOVA test is less than 0.05 at 5 % significant level. The variation factor wise may be due to the fact that economically weaker section depends on small hospitals and better off sections depend on large hospitals.

4.1.2.4 Pair wise analysis of cost consciousness of hospital management based on bed capacity of hospital

Furthermore, it can be analysed that the cost consciousness of hospital management is made to understand on the basis of ownership pattern whether they are similar or dissimilar in this category. For this purpose, Post Hoc Test is carried out and the result is presented below:

Table 4.12: *Post Hoc Test (Tukey HSD)*

Dependent Variable	(I) BED	(J) BED	Mean Difference (I-J)	Std. Error	Sig.
Complaints	0 - 100	101 - 300	.744	.462	.377
		301 - 500	1.701*	.617	**.035****
		501 and above	.278	1.416	.997
	101 - 300	0 - 100	-.744	.462	.377
		301 - 500	.956	.651	.460
		501 and above	-.467	1.431	.988
	301 - 500	0 - 100	-1.701*	.617	**.035****
		101 - 300	-.956	.651	.460
		501 and above	-1.423	1.488	.775
	501 and above	0 - 100	-.278	1.416	.997
		101 - 300	.467	1.431	.988
		301 - 500	1.423	1.488	.775
Priority	0 - 100	101 - 300	-.067	.237	.992
		301 - 500	.477	.317	.439
		501 and above	2.400*	.728	**.008****
	101 - 300	0 - 100	.067	.237	.992
		301 - 500	.544	.334	.370
		501 and above	2.467*	.735	**.006****
	301 - 500	0 - 100	-.477	.317	.439
		101 - 300	-.544	.334	.370
		501 and above	1.923	.765	.065
	501 and above	0 - 100	-2.400*	.728	**.008****
		101 - 300	-2.467*	.735	**.006****
		301 - 500	-1.923	.765	.065

* The mean difference is significant at 0.05 level.

The Table 4.12 Post Hoc comparisons evaluate pairwise differences among the categories of bed size mean scores with the

factors for hospital cost consciousness using Tukey HSD test since equal variances were tenable. Test revealed significant pairwise differences between the mean score of the category of bed size up to 100 beds and 301 to 500 beds in case of consumer complaint on pricing of services. Similarly, in categories of 101 to 300 beds and 501 and above beds as the 'p value' is less than 0.05, it proves that there is a comparable difference.

4.1.2.5 Adoption of cost management practices wise classification of hospital management view about cost consciousness of hospital services

In order to understand the hospital management perception about cost consciousness among hospital based on adoption of cost management practices, the aggregate data have been classified on the basis of bed size and presented in Table 4.13.

Table 4.13: *Distribution of Modern Science hospitals on the basis of adoption of cost management practices*

Periodicity / Factors	Practiced	Unpracticed	Aggregate Score	t Test (p-Value)
Consumer Complaint on pricing of services	4.25 (2.03)	4.41 (2.00)	4.28 (2.02)	.763
Priority for patient's price sensitivity	6.26 (1.14)	6.47 (0.62)	6.30 (1.07)	.466
Affect due to change in price	5.53 (1.63)	5.88 (0.99)	5.60 (1.54)	.264
AGGREGATE	**5.35 (1.02)**	**5.59 (1.06)**	**5.39 (1.03)**	**.791**

*Figures in brackets are the standard deviation.

Above tabulation illustrates that the institutional perception of hospitals practicing cost management has a mean score of 5.35

out of 7, which is 76.4 % whereas the hospitals that are not practising cost management has a slightly higher mean score of 5.59 out of 7, that is 79.8%. To analyse this variation statistically, t Test is used which further proves that the variation is not significant with a 'p value' 0.05, at 5% level of significance. The variation between the two classifications may be due to the lack of vision in the cost management of the institution.

4.1.2.6 Bed Occupancy rates wise classification of hospital management view about cost consciousness of hospital services

In order to understand the management perception about hospitals' cost consciousness among hospital based on bed occupancy rate, the aggregate data have been classified on the basis of bed occupancy rate and presented in Table 4.14.

Table 4.14: *Distribution of Modern Science hospitals on the basis of bed occupancy rate*

BED OCCUPANCY RATE / FACTORS	1 - 25%	25% - 50%	50% - 75%	75% - 100%	Aggregate Score	ANOVA (p-Value)
Consumer Complaint on pricing of services	4.36 (1.93)	4.08 (2.04)	4.42 (2.08)	4.24 (2.17)	4.28 (2.02)	.945
Priority for patient's price sensitivity	6.36 (0.99)	6.38 (0.88)	6.00 (1.47)	6.53 (0.62)	6.30 (1.07)	.414
Affect due to change in price	6.04 (1.24)	5.83 (1.34)	5.13 (1.68)	5.29 (1.83)	5.60 (1.54)	.132
AGGREGATE	**5.59 (1.07)**	**5.43 (1.20)**	**5.18 (0.79)**	**5.35 (1.15)**	**5.39 (1.03)**	**.972**

*Figures in brackets are the standard deviation.

As seen in Table 4.14, the hospitals with bed occupancy rate 1% to 25% shows a slightly higher aggregate mean score of 5.59 (79.8%) as compared to the mean score of hospitals with bed occupancy rate 50.01% to 75% of 5.18 (74%).The variation between the hospitals classified under different bed occupancy rate was further analysed using One-way ANOVA, which statistically proved that there is no significant difference with a 'p value' more than 0.05, at 5% level of significance.

4.1.2.7 Quality Accreditation wise classification of hospital management view about cost consciousness of hospital services

In order to understand the management perception about hospitals' cost consciousness among hospital based on hospital Quality Accreditation, the aggregate data have been classified on the basis of quality accreditation and presented in Table 4.15.

Table 4.15: *Distribution of Modern Science hospitals on the basis of hospital quality accreditation*

QUALITY ACCREDITED / FACTOR	Accredited	Non Accredited	Aggregate Score	t TEST (p-value)
Consumer Complaint on pricing of services	3.80 (1.88)	4.41 (2.05)	4.28 (2.02)	.232
Priority for patient's price sensitivity	6.10 (0.97)	6.36 (1.09)	6.30 (1.07)	.344
Affect due to change in price	4.95 (1.73)	5.79 (1.43)	5.60 (1.54)	.031**
AGGREGATE	**4.95 (1.15)**	**5.52 (1.00)**	**5.39 (1.03)**	**.553**

*Figures in brackets are the standard deviation.
**Significant at 5% level.

Table 4.15 indicates the overall cost consciousness of the hospital management with a mean score of 4.95 in case of quality accredited hospitals, while mean score of 5.52 is visible in case of non-accredited hospitals. The variations between the two categories did not prove significant as statistically, t test proved 'p value' more than 0.05, at 5% significant level.

4.1.2.8 Region wise classification of hospital management view about cost consciousness of hospital services

The aggregate data have been classified on the basis of different regions for a better understanding about the management perception regarding hospitals' cost consciousness and presented in Table 4.16.

Table 4.16: *Distribution of Modern Science hospitals on the basis of region classification*

Region / Elements	North	Central	South	Aggregate Score	ANOVA (p-Value)
Consumer Complaint on pricing of services	4.89 (1.85)	4.20 (1.99)	3.85 (2.11)	4.28 (2.02)	.134
Priority for patient's price sensitivity	6.07 (1.27)	6.37 (0.89)	6.42 (1.03)	6.30 (1.07)	.415
Affect due to change in price	5.33 (1.59)	5.43 (1.63)	5.97 (1.36)	5.60 (1.54)	.216
AGGREGATE	**5.43 (0.60)**	**5.33 (1.09)**	**5.41 (1.37)**	**5.39 (1.03)**	**.993**

*Figures in brackets are the standard deviation.

Table 4.16 discreen that in the region wise classification of the data, North region has an aggregate mean score of 5.43 as compared to the Central and South region which has a mean score of 5.33 and 5.41, respectively. Furthermore, the variation among the region were analysed statistically using One-way ANOVA which proved that the 'p value' more than 0.05 stating that there is no significant difference, at 5% level of significance.

4.1.2.9 Years of establishment classification of hospital management view about cost consciousness of hospital services

In order to understand the management perception about hospitals' cost consciousness among hospital based on years of establishment, the aggregate data have been classified on the basis of years of establishment and presented in Table 4.17.

Table 4.17: *Distribution of Modern Science hospitals on the basis of years of establishment*

Years / Elements	1 – 25yrs	26yrs – 50yrs	51yrs - 75yrs	76yrs-100yrs	Aggregate Score	ANOVA (p-Value)
Consumer Complaint on pricing of services	4.16 (1.94)	4.55 (2.18)	3.67 (2.07)	3.67 (0.58)	4.28 (2.02)	.650
Priority for patient's price sensitivity	6.28 (1.10)	6.29 (1.11)	6.67 (0.52)	6.00 (1.00)	6.30 (1.07)	.814
Affect due to change in price	5.51 (1.72)	5.68 (1.42)	5.67 (1.03)	5.67 (1.53)	5.60 (1.54)	.966
AGGREGATE	**5.32 (1.07)**	**5.51 (0.88)**	**5.34 (1.53)**	**5.11 (1.26)**	**5.39 (1.03)**	**.983**

*Figures in brackets are the standard deviation.

The Table 4.17 shows that the hospitals within the range of 26 years to 50 years of establishment has an aggregate mean score of 5.51 as compared to the hospitals with 76 years to 100 years with a mean score of 5.11. To have a wider knowledge on the variation among the different categorized hospitals, the data was further analysed statistically using One-way ANOVA, which proved that there is no significant difference with a ‘p value’ more than 0.05, at 5% level of significance.

Above analysis concludes that the hospitals’ have higher level of cost consciousness. There lies an aggregate average cost consciousness of 77%. Moreover, the hospitals give a higher priority for patient’s price sensitivity, consumer complaints on pricing of services and mechanizes over the affect due to change in price. There is no noticeable difference between the classifications on the basis of type of hospital, hospital bed capacity, adoption of cost management practices, bed occupancy rate, quality accreditation, region wise distribution and years of establishment.

4.2 Part –B: Cost structure analysis of hospital services

Hospitals and healthcare have become necessitating factors of a family budget. Man has become a carrier of lifestyle diseases due to several reasons. The eventual rise in demand for healthcare services leads to the mushrooming of hospitals reflecting a high potential competitive industry. The iron triangle of health care i.e. cost, quality and access highly demonstrate its sensitivity.

To sustain in this sector, hospitals need to re-engineer their pathways towards various services. Rather than providing well-accomplished facilities, figures tagged to the services played a crucial role. Optimum cost of healthcare is often equated with access to the latest facilities and technology, poised at the cutting edge of hospital care and research.

The researcher here tried to understand the cost structure of the healthcare sector, to which cost element intensity is outstood. Elements of cost are classified as per the Cost Accounting Standards (CAS – 1) issued by the Institute of Cost Accountants of India, 1959. The cost incurred by the hospitals are conceptualized on the basis of their nature of expense as material, labour, and overhead. The study analyses the cost structure of the hospitals on various basis, which includes type, bed size classification, adoption of cost management practice, bed occupancy, quality accreditation, region wise, and years of establishment to understand whether significant variation exist in respect of any of the classifications

followed. Each of the parameters analyses the absorption of elements of cost structure i.e. Material cost, labour cost and overhead cost. Doctors and other staff cost are considered as labour cost. All the indirect expenses form part of the overhead cost.

4.2.1 Aggregate Cost Structure

The cost incurred for the hospitals has been disjointed on the basis of elements of the cost. Materials to this sectors are the consumables used, Labour cost include doctors and other payroll staff including paramedical staff and administrative staff cost. Overheads involve all other indirect expenses like electricity, water and outsourced expenses. The aggregate cost structure of the 90 hospitals are taken as the sample for the study, which has been consolidated in the below Table 4.18.

Table 4.18: *Distribution of Modern Science hospitals' aggregate cost structure (in percentage)*

Elements	Aggregate Score
Material	22.20 (9.63)
Labour	49.70 (12.95)
Overhead	28.10 (11.98)
AGGREGATE	**100**

*Figures in brackets are the standard deviation.

It is revealed from the table that labour cost involves 49.7 per cent of the total cost incurred in the hospital, followed by the overhead cost of 28.1 per cent and material cost of 22.2 per cent.

Healthcare sector is a labour intensive sector wherein doctors' cost involve a major share of the labour cost. Overhead expenses form the second major part of the total cost, recent technological advancement and the technicalities evolved in the diagnostic services brings this significance. Material cost occupies only third position with less than one fourth of the total cost.

4.2.2 Type of Hospital wise classification of cost structure

In order to understand whether any variation exist in the cost structure among different types of hospital in Kerala the above aggregate cost structure data have been classified on the basis of type of hospitals and presented in Table 4.19.

Table 4.19: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of type of hospital (in percentage)*

Type / Elements	General	Multi	Aggregate Score	t Test (p-Value)
Material	21.33 (10.61)	22.52 (9.32)	22.20 (9.63)	.610
Labour	49.38 (14.39)	49.82 (14.94)	49.70 (12.95)	.887
Overhead	29.29 (14.03)	27.67 (11.23)	28.10 (11.98)	.572
AGGREGATE	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

It can be revealed from the above table that in both the general and multi-specialty hospitals labour cost represents half of the total cost followed by overhead cost and material cost.

The above difference between general and multi-specialty hospital are statistically tested with t Test and the result shows no difference exist in respect of all the three elements of cost in general and multi-specialty hospital as the 'p value' is more than 0.05, at 5% level of significance.

4.2.3 Hospital bed capacity wise classification of cost structure

As per industry norms bed size is a criterion followed to classify hospitals. Hence, bed size of the hospital has a major share in the cost formulation. The classification on bed size are: up to 100 beds, 101 – 300 beds, 301 – 500 beds and above 501 beds. To infer whether there is any change in the cost structure due to change in bed size is examined through Table 4.20.

Table 4.20: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of bed size (in percentage)*

Bed Size / Elements	Up to 100 Beds	101 – 300 Beds	301 – 500 Beds	501 and above Beds	Aggregate Score	ANOVA (p-Value)
Material	21.80 (9.20)	21.40 (11.03)	24.85 (8.48)	26.00 (1.41)	22.27 (1.71)	.672
Labour	51.07 (13.16)	48.97 (13.97)	46.62 (10.63)	50.00 (7.07)	49.74 (2.04)	.727
Overhead	27.13 (12.34)	29.63 (11.44)	28.54 (13.21)	24.00 (5.66)	27.99 (1.76)	.798
AGGREGATE	**100**	**100**	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

Table 4.20 illustrates that, in case of the classification under bed size, up to 100 beds, labour cost stays highest with 51.17 per cent of the total cost. Hospitals with 501 and above beds has material cost next to the labour cost, around 26 per cent of the total cost. While other three categories i.e. up to 100 beds, 101 – 300 beds, 301 – 500 beds, overhead cost stands 27.13 per cent, 29.63 per cent, 28.54 per cent respectively, which stays next to labour cost. Overhead cost holds second major portion of the total cost due to the main fact of technological advancement. No much difference exist in the cost structure in hospitals of different bed size. In all hospitals labour cost constitute almost 50 per cent of total cost followed by overhead cost which account for about 25 to 30 per cent of hospital total cost and material cost about 20 to 25 per cent of total cost.

Statically it has been proven that there is no significant difference in the elements of cost under each bed size through One-way ANOVA indicating a ‘p value’ more than 0.05.

4.2.4 Hospital adoption of cost management practice wise classification of cost structure

A highly competitive environment in the healthcare industry especially among the hospitals have invoke the essentiality in inducing cost management practices. There was a time when the hospitals in its miniature group i.e. at the primitive phase of the industry were not bound to confine upon cost management. Today,

the dynamic scenario has overreached a position were sustainability can be encroached only through cost management. This aspect is considered and has been studied by the researcher.

The classification of whether evaluation of cost form part of periodic practice demonstrates a difference in the structure of cost elements. A description of change in the proportion of cost elements to the practiced and unpracticed cost management is measured under this analysis.

Table 4.21: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of adoption of cost management practices (in percentage)*

Periodicity / Elements	**Practiced**	**Unpracticed**	**Aggregate Score**	**t Test (p-Value)**
Material	22.53 (9.72)	20.76 (9.38)	22.20 (9.63)	.498
Labour	49.92 (12.96)	48.76 (13.23)	49.70 (12.95)	.743
Overhead	27.55 (12.11)	30.47 (11.46)	28.10 (11.98)	.368
AGGREGATE	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

Table 4.21 discreen that not much difference exist in various elements of cost by the hospital practicing cost management and that not practicing cost management. In both category hospital labour constitute the most important cost followed by overhead cost and material cost. In those hospitals were cost management is practiced about 50 per cent of the total cost is labour, 27.6 per cent overhead and 22.5 per cent material.

The corresponding figures in hospitals were cost management is not practiced are 48.8 per cent, 30.5 per cent and 20.8 per cent respectively labour, overhead and material. Adopting a periodic practice of cost management and its non – adoption does not show variation as the mean difference is also not statistically significant with the 'p value' above 0.05, at 5% level of significance.

4.2.5 Hospital bed occupancy rate wise classification of cost structure

Bed occupancy rate is a key performance indicator which is used to exhibit the actual utilization of an in-patient health competence for a given period. A bed occupancy rate is an efficiency indicator of the hospital. A classification on the basis of rate of bed occupancy is made to analyze the cost structure significance. The various groups include 0 – 25%, 25.01% - 50%, 50.01% - 75% and 75.01% - 100% of bed occupancy.

Table 4.22: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of bed occupancy rate (in percentage)*

Bed Occupancy Rate / **Elements**	**1 – 25%**	**25% - 50%**	**50% - 75%**	**75% - 100%**	**Aggregate Score**	**ANOVA (p-Value)**
Material	19.15 (8.90)	21.67 (8.85)	26.71 (9.07)	19.86 (10.78)	22.20 (9.63)	2.154
Labour	52.96 (13.56)	47.19 (13.46)	47.25 (12.26)	52.14 (11.72)	49.70 (12.95)	1.215
Overhead	27.93 (12.43)	31.14 (13.85)	26.04 (9.64)	28.00 (12.69)	28.10 (11.98)	0.542
AGGREGATE	**100**	**100**	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

Above Table 4.22 discloses that among all levels of bed occupancy, proportion of labour cost takes major portion followed by overhead and material cost. Through the classifications, a comparatively higher labour cost is viewed in the bed occupancy classification of 1–25 per cent and 75–100 per cent. A considerable difference in overhead and material cost among the classifications can be noticed in the bed occupancy of 25–50 per cent.

Under the classification of 1–25 per cent, 52 per cent is the labour cost as compared to the classification of 25–50 per cent, 50–75 per cent and 75–100 per cent which has a labour cost of 47 per cent, 47 per cent and 52 per cent respectively. While the overhead cost is 27.9 per cent for the bed occupancy of 1–25 per cent as compared to the 31 per cent of the bed occupancy 25–50 per cent. The material cost has a similar cost per cent to the overhead cost in case of bed occupancy rate of 50–75 per cent as the intensity of both the cost have its highest utilization in this category.

Statistically, One-way ANOVA shows no significant difference in the cost structure of these hospitals under bed occupancy rate, justified through ‘p value’ being more than 0.05, at 5% level of significance.

4.2.6 Hospital quality accreditation wise classification of cost structure

Quality is explained as the essentials for improved clinical outcome. A quality assurance system is said to improve the hospital

efficiency thereby the work process and the credibility in capturing patient's confidence. The researcher has plotted the hospitals on the basis of Quality Accreditation. Cost structure has been evaluated on this aspect, whether Quality Accredited hospital and Non – Quality Accredited hospitals have a key difference in their cost structure.

Table 4.23: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of quality accreditation (in percentage)*

Quality Accredited / Elements	**Accredited**	**Non Accredited**	**Aggregate Score**	**t Test (p-Value)**
Material	23.05 (11.46)	21.96 (9.13)	22.20 (9.63)	.657
Labour	50.25 (11.81)	49.54 (13.33)	49.70 (12.95)	.831
Overhead	26.70 (13.56)	28.50 (11.56)	28.10 (11.98)	.556
AGGREGATE	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

Cost structure when interpreted under the layout of Quality Accreditation, labour cost is reflected with 50.3 per cent in Quality Accredited hospitals and 49.5 per cent in Non – Accredited hospitals, as per the indications of the above Table 4.22. Overhead cost and Material cost being 28.5 per cent and 21.9 per cent respectively in Quality Non – Accredited hospitals.

Quality Accredited hospitals has material cost higher than Non – Accredited hospitals, while overhead cost is higher in Non – Accredited hospitals and compared to that of Quality Accredited

hospitals. There is no major variation in both the categories as the cost allocation and cost bearing needs scientific restoration.

Statistically, t Test proved that the difference in the elements of cost is not significant, which has a 'p value' more than 0.05.

4.2.7 Region wise classification of cost structure

Kerala has been segregated to three divisions on the basis of its historical formation. The state has been divided in three regions namely; North, Central and South. The sample of 90 hospitals is categorized region wise and analysis of the elements of cost is determined to understand any variation in cost structure exists in the proportion of each element to the total cost. Through this categorization the researcher analysis the absorption of cost region wise.

Table 4.24: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of region wise assortment (in percentage)*

Region / Elements	North	Central	South	Aggregate Score	ANOVA (p-Value)
Material	24.11 (10.17)	20.73 (10.18)	21.97 (8.66)	22.27 (1.71)	.416
Labour	49.19 (13.75)	52.00 (13.56)	48.03 (11.74)	49.74 (2.04)	.468
Overhead	26.70 (10.64)	27.27 (11.99)	30.00 (13.07)	27.99 (1.76)	.516
AGGREGATE	**100**	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

As per the Table 4.24, in all three region i.e. north, central and south labour cost holds major portion of the total cost. Among the three regions, Central region has the highest of labour cost as compared to the other two regions i.e. North and South. While the North region has the highest of material cost as compared to Central region and South region. On the other hand, the South region has the highest of overhead cost and least in the North region. A non- remarkable difference visualized among the groups is due to the immediate vicinity adaptation.

Overhead cost holds the next major portion with 30 per cent of the total cost in the south region, whereas the north and central region holds 26.7 and 27.3 per cent respectively. In case of the central region, 20.7 per cent of the total cost corresponds to material cost, while the north and south region reflects 24.1 and 21.9 per cent respectively.

However, it has been statically proven through One-way ANOVA that there is no significant difference region wise with a ‘p value’ more than 0.05, at 5% level of significance.

4.2.8 Hospital years of establishment wise classification of cost structure

An analysis with arrangement of hospitals as per the number of years established is condensed in Table 4.25 to understand any variations in cost structure based on years of establishment. The years have been distributed as 1 to 25 years, 26 to 50 years, 51 to 75 years and 76 to 100 years.

Table 4.25: *Distribution of Modern Science hospitals' aggregate cost structure on the basis of years of establishment (in percentage)*

Years / Elements	1-25 Yrs.	26-50 Yrs.	51-75 Yrs.	76-100 Yrs.	Aggregate Score	ANOVA (p-Value)
Material	20.37 (9.90)	23.87 (9.83)	24.17 (7.36)	23.33 (2.89)	22.20 (9.63)	0.993
Labour	50.60 (12.83)	49.66 (14.04)	45.00 (7.75)	46.67 (10.41)	49.70 (12.95)	0.381
Overhead	29.02 (12.86)	26.47 (11.81)	30.83 (7.36)	30.00 (10.00)	28.10 (11.98)	0.439
AGGREGATE	**100**	**100**	**100**	**100**	**100**	

*Figures in brackets are the standard deviation.

The above tabulation indicates that the classification under established years labour cost holds the major part of the cost followed by overhead cost and material cost in all categories of hospitals. The hospitals having established years within 1 to 25 years has the highest of labour cost and those hospitals with 51 to 75 years has the least. This may be mainly due to the seeding phase of the hospital in the first category and entrenched phase in the 51 to 75 years and 76 to 100 years of hospital establishment. On the other hand, overhead cost is highest in hospitals with 51 to 75 years as compared to the hospitals with 26 to 50 years which has the lowest. Similarly, in case of material cost, hospitals having established years within 1 to 25 years has the lowest of these cost compared to the hospitals with 51 to 75 years having the highest.

The hospitals under the category of 1 to 25 years has its major cost in the labour of 50.6 per cent as to the categories of 26 to 50 years, 51 to 75 years and 76 to 100 years with 49.7 per cent, 45 per cent and 46.7 per cent respectively . Of the total cost, 22.2 per cent is owned by the material cost, among the categories, hospitals with established years of 51 to 75 years has the highest with 24.2 per cent. The interpretations reflects that years do not count any difference in the cost structure.

However, statistically using One-way ANOVA shows that there is no significant difference in the variations based on years of establishment, with a ‘p value’ more than 0.05.

To recapitulate, material cost has a substantiating role in the analysis of cost structure of the hospital. Above analysis crystalizes the proportion of material cost to be dealt with in each aspect of hospital cost. Whether it be categorization on the bed occupancy rate or the hospital quality accreditation there lies a significant cost in the overall service cost of a hospital.

From the foregoing analysis of cost structure, it is clear that labour cost constitute about 50 per cent of total cost of hospital services following by overhead cost with around 30 per cent of total cost. Hence, in order to get a detailed understanding of the cost, these two elements have been further analysed with different items of cost constituting labour cost and overhead cost.

4.3 ANALYSIS OF LABOUR COST IN HEALTHCARE SERVICES

Productivity of any organization is measured through the labour support of the organization. Doctors play a key role in the hospital with the assistance of other staffs. Labour cost of the hospital has been grouped as Doctor cost and other staff cost. Hospital being a labour intensive sector, labour cost plays a key role. Doctors cost include both salaried and consultant doctors. Other staffs include all the payroll staffs other than the doctors. Table 4.26 shows the analysis of the labour cost on the basis of the type of hospital.

4.3.1 Type of Hospital wise classification of labour cost structure

An analysis with arrangement of hospitals as per their type is condensed in Table 4.26 to understand any variations in cost structure based on type of the hospital. The hospitals have been categorized as general and multi-specialty hospitals.

Table 4.26: *Distribution of Modern Science hospitals' labour cost structure on the basis of type of hospital (in percentage)*

Type / Elements	General	Multi	Aggregate Score	t Test (p-Value)
Doctors	34.50 (13.51)	31.24 (9.78)	32.87 (2.31)	0.092
Other Staff	14.88 (5.93)	18.58 (9.41)	16.73 (2.62)	0.154
AGGREGATE	**49.38**	**49.82**	**49.60**	**.987**

*Figures in brackets are the standard deviation.

It can be observed from the table that, of the aggregate labour cost of 49.60 per cent, approximately 33 per cent Doctors' cost and 17 per cent other staff cost. General Hospitals shows Doctors cost higher as compared to that the Multi-specialty Hospitals. In case of other staff cost, Multi-specialty Hospitals has higher percentage of cost as compared to that of General hospitals. A countable difference in the other staff cost may be due to the employee overload in the Multi – specialty hospitals. Cost of doctors bore highest due to the fact of heavy payment initiations. Further details can be observed from the table.

On the basis of t Test, it has been proven that there is no significant difference in the doctors cost in both the types of hospitals, as the 'p value' is more than 0.05 at 5% significant level.

4.3.2 Bed capacity of Hospital wise classification of labour cost structure

To have a deeper understanding of the components of labour cost and the existence of variation based on hospital bed size, the above data has been classified accordingly and presented in the Table 4.27.

Table 4.27: *Distribution of Modern Science hospitals' labour cost structure on the basis of bed size (in percentage)*

Bed Size / Elements	Up to 100 Beds	101 – 300 Beds	301 – 500 Beds	501 and above Beds	Aggregate Score	ANOVA (p-Value)
Doctors	32.07 (12.67)	30.13 (9.17)	27.54 (8.92)	17.50 (10.61)	32.87 (2.31)	0.137
Other staff	18.00 (9.16)	17.93 (9.11)	16.77 (6.56)	12.00 (2.83)	16.73 (2.62)	0.364
AGGREGATE	**50.07**	**48.06**	**44.31**	**29.50**	**49.60**	**.598**

*Figures in brackets are the standard deviation.

It is very clear from the above Table 4.27 that the Doctors' cost has highest portion of total labour cost in the category of bed size up to 100 beds as compared to the other categories, the least of which can be observed in 501 and above beds. A major difference in the two categories can be sketched because of the application of volume distribution. Other staff cost evolve its least in the category of 501 and above beds and its most in the category of up to 100 beds. A discriminant variation in the bed size and its labour cost can be expanded on the volume determination.

The doctors cost is 32 per cent when compared to the other staff cost of 18 per cent in case of bed size up to 100 beds. For the bed size of 301 to 500 beds, Doctors' cost is 27.5 per cent and other staff cost stands 16.8 per cent.

However, One-way ANOVA shows that there is no significant difference in the labour cost elements between the

categorized bed size hospitals, were the 'p value' is more than 0.05, at 5% level of significance.

4.3.3 Adoption of cost management practices of Hospital wise classification of labour cost structure

The data redirecting to labour cost has been further classified into Doctors' cost and other staff cost on the basis of adoption of cost management practices by hospitals and the details are given in the Table 4.28.

Table 4.28: *Distribution of Modern Science hospitals' labour cost structure on the basis of adoption of cost management practices (in percentage)*

Period / Elements	Practiced	Unpracticed	Aggregate Score	t Test (p-Value)
Doctors	32.52 (10.95)	30.35 (10.91)	32.87 (2.31)	0.660
Other staff	17.40 (8.23)	18.41 (8.60)	16.73 (2.62)	0.862
AGGREGATE	**49.92**	**48.76**	**49.60**	**.958**

*Figures in brackets are the standard deviation.

It can be noticed from the table that under the periodic cost evaluation practiced hospitals Doctors' cost is slightly higher as compared to the unpracticed. While other staff cost is noticed slightly higher proportion in the periodic evaluation of cost unpracticed hospitals as to the practiced hospitals. An unscientific evaluation of cost may be the major factor for this variation in labour cost.

The cost for doctors in cost management practiced hospitals is 32.5 per cent and those unpracticed hospitals is 30.4 per cent. While the other staff cost tends to be 17.4 and 18.4 per cent respectively in cost management practiced and unpracticed hospitals.

But, the difference is not statistically significant as the 'p value' is more than 0.05, at 5% level of significance.

4.3.4 Bed Occupancy Rate of Hospital wise classification of labour cost structure

Bed occupancy rate in itself occupies the cost recovery of any hospital, the average cost that can be recovered through the utilization of bed (inpatients).Here, the analysis clarifies the labour cost categorization and the bed occupancy rate relationship.

Table 4.29: *Distribution of Modern Science hospitals' labour cost structure on the basis of bed occupancy rate (in percentage)*

Bed Occupancy Rate / Elements	**0 – 25 %**	**25- 50 %**	**50- 75 %**	**75-100 %**	**Aggregate Score**	**ANOVA (p-Value)**
Doctors	34.22 (12.59)	29.67 (13.15)	27.96 (8.78)	29.29 (8.29)	32.87 (2.31)	0.268
Other Staff	18.67 (9.92)	17.52 (9.63)	15.89 (7.10)	19.50 (7.67)	16.73 (2.62)	0.749
AGGREGATE	**52.89**	**47.19**	**43.85**	**48.79**	**49.60**	**.962**

*Figures in brackets are the standard deviation.

Table 4.29 discreens the labour cost classified under bed occupancy rate. The category of bed occupancy rate of 0 to 25 per cent has the dominant share of doctors' cost as to the category of 50 to 75 per cent is considered as the least. A cause for this scenario is that the bed occupancy rate of 0 to 25 per cent does not meet the break even cost for the hospital. The other staff cost is least at 50 to 75 per cent and most at 75 to 100 per cent.

The classification of 0 to 25 per cent stays apical in case of Doctors' cost with 34.2 per cent as in case of 50 to 75 per cent bed occupancy rate which is 27.9 per cent. An abbreviation to the other staff cost particulates 18.6 per cent and 15.89 per cent for hospitals under bed occupancy rate of 0 to 25 per cent and 50 to 75 per cent, respectively. Overall no significant difference exist in the labour cost elements of hospitals over different bed occupancy rate.

One-way ANOVA correlates this as the 'p value' is more than 0.05, at 5% level of significance.

4.3.5 Quality Accreditation of Hospital wise classification of labour cost structure

Labour cost has been further classified on the basis of quality accreditation and presented in Table 4.30

Table 4.30: *Distribution of Modern Science hospitals' labour cost structure on the basis of quality accreditation (in percentage)*

Quality Accredited / Elements	Accredited	Non Accredited	Aggregate Score	t Test (p-Value)
Doctors	31.75 (6.74)	32.21 (11.88)	32.87 (2.31)	0.009**
Other Staff	18.50 (9.88)	17.33 (8.46)	16.73 (2.62)	0.854
AGGREGATE	**50.25**	**49.54**	**49.60**	**.975**

*Figures in brackets are the standard deviation.
**Significant at 5% level.

Table 4.30 reveals that, among the 17 Quality Accredited hospitals and 73 Non – Accredited hospitals, the doctors' cost is higher for Quality Non – Accredited hospitals as compared to that of Quality Accredited hospitals. Similarly, Quality Accredited absorbs a better portion of the other staff cost as compared to the Quality Non – Accredited hospitals. This variation can seemingly be upheld on the criteria of better scientific method of cost allocation. A drastic concentration of cost can be observed in the doctors' cost which proves that the standardization of labour cost in all aspect is essential.

The aggregate 32.97 per cent of the total labour cost is absorbed by the cost for Doctor. As aggregate, 31.75 per cent and 32.2 per cent are the doctors' cost in case of Accredited and Non – Accredited hospitals, respectively. The other staff cost stood 18.5 per cent and 17.3 per cent in case of Quality Accredited and Non – Accredited hospitals, respectively.

Analytically, it has been proven that there is a significant difference between the Quality Accredited hospitals and Non – Quality Accredited hospitals in case of Doctors' cost proving a 'p value' less than 0.05. On the other hand, other staff cost does not show any significant difference with a 'p value' more than 0.05, at 5% level of significance.

4.3.6 Region wise classification of labour cost structure

Region wise description of the labour cost structure analysis is depicted in Table 4.31. Comparing the three regions, it can be seen that North region has a higher Doctors' cost as compared to the other two regions. In case of other staff cost, Central region holds the highest of its cost while North region the least of the cost. A major reason in the variation of Doctors' cost among the regions proclaims an attitudinal difference in defining a doctor.

Table 4.31: *Distribution of Modern Science hospitals' labour cost structure on the basis of region wise classification (in percentage)*

Region / Elements	North	Central	South	Aggregate Score	ANOVA (p-value)
Doctors	34.52 (11.53)	28.77 (8.42)	32.89 (12.02)	32.87 (2.31)	.125
Other Staff	13.52 (6.54)	23.23 (10.26)	16.30 (5.67)	16.73 (2.62)	.000**
AGGREGATE	**48.04**	**52.00**	**49.19**	**49.60**	**.872**

*Figures in brackets are the standard deviation.
**Significant at 5% level.

Labour cost has its major share for the doctors cost of 34.5per cent in the North region of Kerala, while 28.8 per cent is observed in the Central region and 32.8 per cent in the South region. An average of 16.3 per cent of the labour cost form part of the other staff cost in the South region, while Central and North region carries 23.23 per cent and 13.52 per cent respectively.

One-way ANOVA having a 'p value' more than 0.05 explains no significant difference among the region wise Doctor's cost, on the other hand other staff cost shows a significant difference with a 'p value' less than 0.05. Further an analysis to this significant value is done through Post Hoc test.

4.3.7 Pair wise analysis of labour cost of hospitals' based on Region classification

It can be analyzed that the price sensitivity is made understand whether ownership pattern are similar and dissimilar in this respondent. For this purpose, Post Hoc Test is carried out and the result is presented below:

Table 4.32: *Post Hoc Test (Tukey HSD)*

(I) REGION	(J) REGION	Mean Difference (I-J)	Std. Error	Sig.
North	Central	-6.33*	2.057	.008
	South	3.23	2.012	.250
Central	North	6.33*	2.057	.008
	South	9.55*	1.956	.000
South	North	-3.23	2.012	.250
	Central	-9.55*	1.956	.000

* The mean difference is significant at 0.05 level.

Table 4.32 Post Hoc comparison evaluates pairwise differences among the group means using Tukey HSD test since equal variances were tenable. Tests revealed significant pairwise differences between the mean score of other staff cost in the North and Central region, similarly in Central and South region as the p value in both cases is less than 0.05, at 5% level of significance. Moreover, the comparison between the other staff cost of North and South region is not significantly different as the 'p value' establishes a more than 0.05, at 5% level of significance.

4.3.8 Years of establishment wise classification of labour cost structure

Substantiating the fact regarding the cost structure through the established years of a hospital can be viewed in the Table 4.33.

Table 4.33: *Distribution of Modern Science hospitals' labour cost structure on the basis of year of establishment wise classification (in percentage)*

Years / Elements	1 – 25 Yrs	26-50 Yrs	51-75 Yrs	76-100 Yrs	Aggregate Score	ANOVA (p-Value)
Doctors	21.67 (7.64)	28.33 (7.53)	31.55 (10.63)	21.67 (7.64)	32.87 (2.31)	0.494
Other staff	25.00 (13.23)	17.50 (8.22)	18.89 (9.51)	25.00 (13.23)	16.73 (2.62)	0.230
AGGREGATE	**46.67**	**45.83**	**50.44**	**46.67**	**49.60**	**.980**

*Figures in brackets are the standard deviation.

In all categories of hospitals, except 1 – 25 years the doctors' cost is the major element followed by other staff cost. Further, in case of first category hospitals, other staff cost is higher than doctors cost. Further details can be seen in the Table 4.33. Furthermore, statistically One-way ANOVA indicates that there is no significant difference between the hospitals with different established years and their labour cost with 'p value' more than 0.05, at 5% level of significance.

This part of the chapter concludes the classification of aggregate labour cost on various basis, signifying that Doctors' cost hold a higher proportion of cost as compared to technological cost. It has been fairly proved that 33% of the total labour cost is shared by the doctors cost.

4.4 ANALYSIS OF OVERHEAD COST OF HELATHCARE SERVICES

Another element of cost, which occupies second position after labour cost is overhead cost. It explains the indirect expenses which form part of the overall cost and doesn't include direct material and direct labour. Overhead is further explained as technology cost and quality cost. Technology cost are the cost incurred for furnishing the technical services including laboratory, radiology and other medical support services of the hospital. Quality attainment cost of the hospital is the second half of the overhead cost.

4.4.1 Type wise classification of Overhead cost structure in Modern Science hospitals in Kerala

As explained above, the Overhead cost is further split into technology cost and Quality cost. This is further classified on the basis of type of hospitals and presented in the Table 4.34.

Table 4.34: *Distribution of Modern Science hospitals' overhead cost structure on the basis of type wise classification (in percentage)*

Type / Elements	General	Multi	Aggregate Score	t Test (p-value)
Technology	18.88 (12.35)	17.34 (8.67)	18.11 (1.09)	0.592
Quality	10.42 (4.68)	10.29 (6.31)	10.36 (0.92)	0.927
AGGREGATE	**29.30**	**27.63**	**28.47**	**.894**

*Figures in brackets are the standard deviation.

The category of General hospitals holds technology cost of 18.9 per cent while the multi hospitals are carried away with 17.3 per cent. It can be observed from the table that of the total overhead cost of 28.47 per cent, 18 per cent is technology cost and 10.4 per cent is quality cost. Not much difference exist in this respect between general and multi-specialty hospitals.

Statistically also the minor difference in technology cost and quality cost between general and multi-specialty hospital are not statistically significant as the computed 'p value' is higher than 0.05, at 5% significant level.

4.4.2 Bed size classification of Overhead cost structure in Modern Science hospitals in Kerala

In order to examine any variation exist in technology cost and quality cost in the total overhead cost between hospitals with different bed capacity. The aggregate data has been classified and presented in Table 4.35.

Table 4.35: *Distribution of Modern Science hospitals' overhead cost structure on the basis of bed capacity wise classification (in percentage)*

Bed Size / Elements	Up to 100 Beds	101 – 300 Beds	301 – 500 Beds	501and above Beds	Aggregate Score	ANOVA (p-Value)
Technology	17.96 (10.45)	18.17 (9.09)	17.15 (9.50)	12.00 (2.83)	18.11 (1.09)	0.851
Quality	9.18 (4.68)	11.47 (6.80)	11.38 (7.19)	12.00 (2.83)	10.36 (0.92)	0.522
AGGREGATE	**27.14**	**29.64**	**28.53**	**24.00**	**28.47**	**.922**

*Figures in brackets are the standard deviation.

The table reveals that not much difference exist in this respect in hospitals with different bed capacities. In all category of hospitals technology cost is more than half of total overhead cost except in hospitals with 501 and above bed capacity. This may be due to the volume of bed in such hospitals.

On the basis of One-way ANOVA, it has been proved that there is no significant difference between the groups, as p value proves more than 0.05, at 5% level of significance.

4.4.3 Adoption of cost management practices classification of Overhead cost structure in Modern Science hospitals in Kerala

The overhead cost has been analysed on the basis of hospital evaluation of cost management practiced.

Table 4.36: *Distribution of Modern Science hospitals' overhead cost structure on the basis of bed capacity wise classification (in percentage)*

Period / Elements	Practiced	Unpracticed	Aggregate Score	t Test (p-Value)
Technology	17.26 (9.84)	20.00 (8.99)	18.11 (1.09)	.297
Quality	10.29 (6.00)	10.47 (5.34)	10.36 (0.92)	.908
AGGREGATE	**27.55**	**30.47**	**28.47**	**.828**

*Figures in brackets are the standard deviation.

Table 4.36 concludes that, the hospitals practiced with periodic cost evaluation and unpracticed hospitals have a considerable portion of 18 per cent technology cost. Whereas, practiced hospitals' technology cost is 17.3 per cent as to the 20 per cent in case of unpracticed hospitals. A significant variation is not shown as per the t test with a 'p value' more than 0.05.

4.4.4 Bed occupancy rate classification of Overhead cost structure in Modern Science hospitals in Kerala

The overhead cost structure has been classified on the basis of bed occupancy rate of the hospitals.

Table 4.37: *Distribution of Modern Science hospitals' overhead cost structure on the basis of bed occupancy rate (in percentage)*

Bed Occupancy Rate / Elements	0-25 %	25-50 %	50-75 %	75-100 %	Aggregate Score	ANOVA (p-value)
Technology	16.59 (11.17)	20.95 (11.14)	18.00 (7.33)	14.86 (7.96)	18.11 (1.09)	0.421
Quality	10.85 (5.46)	10.19 (5.85)	8.75 (4.19)	12.64 (8.62)	10.36 (0.92)	0.274
AGGREGATE	**27.44**	**31.14**	**26.75**	**27.50**	**28.47**	**.975**

*Figures in brackets are the standard deviation.

The efficiency of the hospital is evaluated through the Table 4.37. The hospitals having bed occupancy rate of 25% to 50% has technology cost of 21 per cent and hospitals with bed occupancy 75% to 100% has 15 per cent. The category of 50% to 75% bed occupancy rated hospitals has quality cost of 8.8 per cent.

Through One-way ANOVA with 'p value' more than 0.05, it's clear that there is no significant difference between the groups.

4.4.5 Quality Accreditation classification of Overhead cost structure in Modern Science hospitals in Kerala

Below the tabulated presents the overhead cost structure on the basis of quality accreditation of the hospitals.

Table 4.38: *Distribution of Modern Science hospitals' overhead cost structure on the basis of quality accreditation classification (in percentage)*

Quality Accredited / Elements	Accredited	Non Accredited	Aggregate Score	t Test (p-Value)
Technology	14.65 (10.41)	18.67 (9.37)	18.11 (1.09)	0.171
Quality	12.05 (8.11)	9.83 (5.00)	10.36 (0.92)	0.521
AGGREGATE	**26.70**	**28.5**	**28.47**	**.873**

*Figures in brackets are the standard deviation.

The magnitude of differences in Quality Accredited and Non – Quality Accredited hospitals is indicated in the above Table 4.38. Technology cost is 14.7 per cent and 18.7 per cent in case of Quality Accredited and Non – Accredited hospitals, respectively. Quality cost involves 9.8 per cent in case of Non – Quality Accredited hospitals, while Quality Accredited hospitals is served with 12.1 per cent. This distinction is not significant, proved statistically through t test 'p value' more than 0.05, at 5% level of significance.

4.4.6 Region wise classification of Overhead cost structure in Modern Science hospitals in Kerala

Region wise overhead cost has been categorized in the tabulated form.

Table 4.39*: Distribution of Modern Science hospitals' overhead cost structure on the basis of region wise classification (in percentage)*

Region / Elements	North	Central	South	Aggregate Score	ANOVA (p-Value)
Technology	20.55 (10.87)	16.30 (9.43)	16.04 (7.87)	18.11 (1.09)	0.119
Quality	9.45 (4.94)	10.97 (6.95)	10.67 (5.65)	10.36 (0.92)	0.559
AGGREGATE	**30.00**	**27.27**	**26.71**	**28.47**	**.951**

*Figures in brackets are the standard deviation.

As per the Table 4.39, in each of the region i.e. north, central and south technology cost absorbs major portion of the overhead cost with 20.6 per cent, 16.3 per cent and 16 per cent, respectively. Quality cost with 9.5 per cent in the north region and 11 per cent of the total overhead cost corresponds to central and south region.

Through the statically proven 'p value' which is more than 0.05, at 5% level of significance, there is no difference based on region wise classification.

4.4.7 Years of Establishment classification of Overhead cost structure in Modern Science hospitals in Kerala

The overhead cost classification i.e., technology cost and quality cost has been summed up on the basis of years of establishment of the hospitals.

Table 4.40: *Distribution of Modern Science hospitals' overhead cost structure on the basis of years of establishment classification (in percentage)*

Years / Elements	1 – 25 Yrs.	26-50 Yrs.	51-75 Yrs.	76-100 Yrs.	Aggregate Score	ANOVA (p-value)
Technology	18.02 (10.75)	17.11 (9.15)	19.17 (5.85)	20.00 (10.00)	18.11 (1.09)	0.924
Quality	11.23 (6.26)	9.11 (5.85)	11.67 (2.58)	10.00 (0.00)	10.36 (0.92)	0.396
AGGREGATE	**29.25**	**26.22**	**30.84**	**30.00**	**28.47**	**.978**

*Figures in brackets are the standard deviation.

The above tabulation indicates that the hospitals under the category of 1 year to 25 years has technology cost of 18 per cent. Of the total overhead cost, 11.2 per cent is owned by the quality, cost among the hospitals with 1 to 25 years of establishment, whereas with the established years of 26 years to 50 years it is 9.1 per cent and for 51 – 75 years it is 11.7 per cent.

Analytically, One-way ANOVA does not prove significant with a 'p value' of more than 0.05 at 5% level of significance.

This section summarizes the overhead cost structure on the basis of various factors of analysis. It further proves that an aggregate of 18% of the overhead cost is shared by technology

cost. One of the significant reason for the higher technology cost may be the technological advancement in this sector.

Reference

1. Berry, L.L. and Yadav, M.S. (1996). Capture and communicate value in pricing of services, *Sloan Management Review*, 37, 41-51.

Chapter V

COST MANAGEMENT PRACTICES AND ACTIVITY BASED COSTING OF MODERN SCIENCE HOSPITALS IN KERALA

Traditional cost accounting focuses on the cost of doing something whereas Activity Based Costing also records the cost of not doing something.

– Peter .F. Drucker

A competition led economy is always vigorous in renovating its edges for sustainability. Today, hospitals lead a dynamic situation where their visibility is captured in a tremendously competitive environment and cost management has become a crucial weapon. Fundamental rethinking for contemporary measures of performance such as cost, quality, service, and speed is essential. A surgical approach to profitability and cost management, by understanding which services, consumers and channels are truly profitable and which elements are draining value from the process has become a necessitated action.

The entire gamut of the cost accounting system has been broadened to equip and assist managers to better serve the needs of the consumers and manage the firm's business processes that are used to create consumer value. The vital aspect here is providing consumer value for less cost than its competitors, thus enhancing the competitiveness and profitability of the firm. Management of the cost for sustenance in the competitive market is a strategic

theory of Management. Cost management is the method of planning and controlling of an organization's cost managing activity in the short and long term. As managers develop their strategies, they must address two main challenges — profitability in the short term and securing a competitive position in the long term.

5.1 COST MANAGEMENT

Beginning from the procedure of ascertaining cost i.e. costing into the collection, interpretation and prevention of cost is formulated under cost management. In other words, cost efficacy is dealt through cost management. Cost that do not add value must be eliminated in order to refine the costing procedure. Cost benefit analysis is recognized as a well shed management technique, but in a longer perspective it is unclear that whether the sources may concentrate loss overtime. Therefore, management of cost require the in-depth vision of effectiveness and efficiency through underlined cost control and cost reduction methods. Hansen - Mowen (2003)[1] has identified the following factors affecting cost management.

(a) Global Competition-Free market economic policies and improvement in transportation and communication system have led to a global market for manufacturing and service firms. This new competitive environment has increased the

demand not only for more cost information but also for more accurate cost information.

(b) Growth of the Service Industry-The service sector had a meteoric rise in the last decade and a half. The liberalization and deregulation of many services like Airlines, Telecommunications and other Utility sectors has resulted in fierce competition in this segment. The increased competition has made managers in this industry more conscious of the need to have accurate cost information for planning, controlling and decision-making.

(c) Advances in Information Technology-The Information Technology innovations have revolutionized every aspect of business management. The Enterprise Resource planning (ERP) which provides an integrated software system that can run all the operations of a company, the availability of Personal Computer (PC), Online Analytic Programs (OLAP), Decision Support System (DSS) and the Electronic Data Interchange (EDI) which involves the exchange of documents between computers using telephone lines have empowered the cost accountant to become more flexible to respond to the managerial need for more complex product costing.

(d) Total Quality Management-Nonstop improvement and the elimination of waste are the two basic criteria of

contemporary manufacturing. Product Quality is the key to success in today's highly competitive business environment. Cost management supports the concept of Total Quality Management by providing crucial information concerning quality related activities and quality cost control.

(e) Time and Efficiency as a Competitive Element.-Time and Efficiency are two vital components in the phases of the value chain. The highly competitive environment forces modern day firms to reduce time to market by redesigning products and processes, by eliminating waste and non-value- added activities. Similarly improving efficiency is also an essential concern. Cost is a critical measure of efficiency. For the various efficiency measures to be of values, cost must be properly defined, measured and accurately assigned. All these factors have resulted in the need to innovate and introduce strategic cost control techniques in order to withstand the prevailing competitive business environment and enhancing competitiveness. Bench marking has been evolved as a potent tool to be used for Strategic Cost Control and to improve and enhance competitiveness.

The two major concepts that occupy cost management are-cost control and cost reduction. They correlate the management syntax of cost.

Cost Control: Various concepts of cost complicate the problem of adapting a costing system that provides for adequate control. Control is a tool to measure the effective combination of the factors of management. Control has been defined as the continuous process of conscious directing or influencing of certain causes so that certain desired effects will result. Cost control involves budget deciding targets of different expenses and creation of responsibility centre. It does not only evolve monetary limits on cost but it also involves optimum utilization of resources or performing the same job at the same cost, creating no cost beyond a particular level.

Cost Reduction: According to Brierly et.al (2007)[2], a cost can be a vague and indeterminate concept, and as a consequence a variety of costs can be identified for reduction. Cost cutting decisions that are based on a flawed understanding of the situation can lead to counterproductive outcomes. Few means that include cost reduction are increasing productivity, reducing wastage and improving efficiency. Searching for alternative materials also drives cost reduction. A constant drive to reduce cost, i.e. reducing cost per unit is also a means of strategic cost analysis.

Various tools that formulate cost management include the following:

1. Value Analysis – It is an approach that review the process to identify and eliminate the activities that do not add value to the service but incur cost for providing the service. The

key focus is the management of functionality to yield value to consumer.

2. Value Engineering – An approach that triggers complete overhaul of the system, alternate design, alternate material, design verification of strength. In overall a cost control mechanism.

3. Work study – Alongside ergonomics, measuring the work and improving it lead through a whole series of action to improve the efficiency through cost management.

4. Job evaluation – On the basis of performance a scientific analysis and assessment of job to determine the relative value within the organization.

5. Quality control – Continuous improvement efforts when properly applied ultimately leads to financial savings. Quality is a multi-dimensional attribute, cost- quality relationship contributes to a higher clinical outcome ratio.

6. Classification and codification – Classification is the grouping of items with similarity. Accurate classification of all items is actually an advantage to any form of cost analysis and control system. Codification helps in easy identification, coding can be done by allotting numerical codes or alphabetical codes or a combination of both.

7. Standardization and simplification – Standardization and simplification creates accuracy in coordination and classification of cost, relatively analyzing the cost incurred.

8. Inventory Management – Minimizing inventory carrying cost and processing cost is a vital step for success and survival of a business. Stock piling also creates inefficiency in cost management.

9. Benchmarking – Ensures comparability for a best practice, in other words to quantify organizational performance to competitors and identify their performance, cost and apply insight to strengthen competitive responses.

10. Business process re-engineering – Redeveloping a business process with the core objective of improving output, quality and reducing cost. To figure out inefficiency and eliminate the line of activities.

11. Outsourcing: The pattern of business were by a segment is contracted to a third party for functioning.

5.2 ENIGMA OF HEALTHCARE COMPETITION

Healthcare sector has certainly grown horizontally and vertically in India, which has deep-rooted the competition level in this sector. The most beneficial concept of this competitive market is that, overtime the consumers or the end users are much aware about the facilities that has broaden the space in a hospital.

Creating a contrastive review on the charges affixed for the services, bringing the consumers more price sensitivity and ultimately leading the industry much cost conscious.

In length to the intensity of competition that healthcare industry bears today, the means of surpassing the quality and price has narrowed. Advancement in technology and the abundance in the facilities provided has overruled to a certain extent that the competition persists. The showcasing of high responsiveness by the consumers towards the healthcare services have proven the significance of cost consciousness among the hospitals to sustain the strength of competition.

5.3 COST: AN EVENLY SPREAD

Over the yester years, full absorption costing had played a vital role in outlining the hospital cost. Assimilation of cost is metaphoric to absorption costing method. In other words, cost of the hospital is absorbed and proportioned on highly suitable single base, known as peanut butter method. The method of spreading cost based on a broadly defined actively level, a not very precise method of assigning cost. This method reflects the idea that the organization would apply the same tactics to all aspects of a business cost smoothing. The conventional cost management practice underwent various flaws which was later adjudged by cost control techniques like standard costing, budgetary control etc. Affixing of losses and wastages incurred by the conventional

model of cost management was later controlled by predetermining the cost of various process and services i.e. standard costing and also inculcating a control system through budgetary modules. But, recent trends in the technological and technical aspect of the healthcare industry has brought forward some points of disruption into the costing arena of hospitals. Rather a peculiar distortion in the elements of cost is highly visible through these trends. The lack of accurate, reliable cost data is an enormous risk to the long-term viability of hospitals and health systems. Overhead cost proved a substantial increase in the vitals of cost.

Hospital care vary in size, service breadth and service depths. Overall, hospital overhead costs may be caused by volume (number of patient days and number of discharges), capacity (number of available hospital beds), and complexity (number of medical services and depth of ancillary services).Therefore, indirect cost showed a versatile difference in the costing structure of hospitals. Most hospitals don't even know if they are making or losing money on service lines or episodes of care.

Mere apportionment in the overhead cost did not prove significant in analyzing the overhead cost, rather activity wise analysis proved significant. In other words, analyzing activity wise costing and allocating cost incurred by each activity proved scientific. The emergence of cost of activities indulged into the finding of cost drivers leading to the factors that cause a level of change to the cost in an activity. Overhead cost drivers were the

neglected drivers, resulting in an unscientific technique of costing. Permanent reduction in cost and improving the competitiveness and profitability probed the degree of modern cost management techniques.

Competition is highly focused and multiple services play a significant role, necessitating multiple costing, removing undercosting and overcosting.

Over the years of technological and technical advancement, a substantial change in the cost structure of the healthcare industry can be observed, restating the various elements of cost .i.e. material, labor and overhead. Drastically, overhead has turned out to be a challenging cost in the current scenario mainly due to the healthcare facilities and technicalities that have nourished this industry through the yesteryears. In other words, the indirect cost has got a compactable shift which has become a point of examination today. Proportioning and apportioning of various indirect costs to the different departments of a hospital need a critical valuation for effective cost management. The role of Activity Based Costing arises here, creating the relevance for analyzing activities that add value to the service and initiates cost that need to be highlighted in rendering better cost management.

5.4 GUESSTIMATE: A VALUESS NOTION

Guesstimate valued the cost of services, presiding into an insignificant nurturing of cost. Dumped up with various

proportionalities, cost for healthcare service is unsystematic in its own way. Costing was least considerate until competition rouse the essentiality of cost management in healthcare sector. Furthermore, realization to the fact of technological cost reestablished overhead cost mechanism.

The accounting purpose of a cost driver means the cause factor changes the nature of costs to be allocated. The basic purpose of an allocation base (or factor) – cost driver is complementary to the first inductive effect. In accounting terms, the activities are consuming resources and activities are based on their underlying triggers (e.g., products, service-lines, consumers). Activity Based Costing helps in getting the visibility into the costs. Identification of overhead or indirect cost drivers can be the impetus for more efficient management of the resources devoted to health care.

The rising cost of healthcare is a globally pressing concern. This makes detailed attention to the way in which costing is carried out of central importance. The reliability problem in healthcare costing is due to the difficulties of calculating accurate costs in healthcare. To address these challenges, health providers use different costing methods, leading to costing practice variation. Cost differences between providers arise, then, not only from different resource consumption patterns, but also from costing practices variation .To achieve this, some countries, e.g., Germany, The Netherlands, and Denmark, have introduced patient-level

costing, following a predominantly bottom-up activity-based costing approach. Other countries, e.g., England and Ireland, are currently considering a shift away from a predominantly top-down volume-based costing approach towards bottom-up activity based costing.

In the healthcare system, increasing costs, decreasing profitability, inadequate access, and poor quality, lie within organizational operations—the nuts and bolts of healthcare delivery. The healthcare arena is filled with opportunities for significant operational improvements, to increase the effectiveness and efficiency of tomorrow's healthcare system. Facing cost pressure in healthcare, costing practices are of increasing concern. A key characteristic of costing in healthcare lays in the specifics of the healthcare sector itself. In this sector, key decisions on the long-term evolution of services are made by outside provider organizations. Growing competition from less costly and more convenient alternative delivery modes; increasing use of medical purchasing power by third-party payers and the business community; and increasing regulatory intervention into hospital operations by state and local government are among environmental trends which threaten the continued survival of many hospitals as autonomous institutions. In face of these tendencies, many hospitals are under pressure to become more cost efficient. In this situation, attention to the acceptable accounting and costing

systems is paid, in order to improve the efficiency of existing operations.

5.5 ACTIVITY BASED COSTING (ABC)

As in the case of manufacturing organizations, one of the key factors of effective company management is ability of accurate estimation of the cost of products. Product costing is an essential economic tool used to quantify the cost of individual interventions carried out. Most hospitals with costs management systems, use the absorption method. Traditional cost methods have caused distortions in indirect costs and financial reports normally do not provide the managers' interpretations and actions for the control of deviations related to specific problems; also, their actions are rarely reflected in accounting reports. The difficulty inherent in choosing a proper and accurate product costing method for manufacturing enterprises has been widely discussed by academics and practitioners. The important limitation of traditional (absorption) costing methods have been also deeply discussed along with advantages of other costing technique as Variable costing or Activity-based costing (ABC). The use of ABC in hospitals generated significant contribution to hospital management in planning and managerial control, as they enable organizational behavioral changes by enhancing the attention focus for activities due to volumes.

Application of the ABC in healthcare institution entails a number of predictable benefits, especially the ability to quantify the actual costs of activities, to identify the relationship between the costs and means of carrying out these activities, to identify capacity influences on the overall costs of the organization and in the assessment of legislative issues regarding the reimbursement of particular performances to also measure the “profitability” of provided operations. It is necessary to view profitability in this case as an identified discrepancy between the amount of reimbursement for a certain performance and the actual (full) cost after taking into account all overhead costs. Despite the fact that Activity-based costing technique had been originally developed for the use in the manufacturing organizations, use of the technique in non-manufacturing sectors, such as services or healthcare is not unique, but relative frequent. ABC applications in manufacturing organizations have remained the focal point of interest for academics and practitioners during the 1990´s, but in the middle of the decade, we can identify the early applications of the technique in healthcare institutions incurred.

The previous chapter organizes various cost incurred in a hospital in a scientific manner. Categorizing of cost on its nature is the satire objective of this research. Here, this chapter gives an insights into the cost management practices prevailing in the hospital sector and the level of awareness about Activity Based Costing technique. The first section of the chapter looks into the level of cost management and cost control among the hospitals.

Moreover, various cost control and reduction techniques practiced among the hospitals has also been analyzed. Cost control, an important derivative of cost management to sustain in the competitive scenario. Modern business management not only must plan for the future but also must constantly scrutinize the results of operations, so that wherever possible, out of control situations can be attacked and eliminated. Cost reduction always endeavours to achieve a real and permanent reduction in cost. Cost reduction starts where control ends cost. The philosophy behind cost reduction is that no item of expenditure is in such an idle level as to preclude reduction.

5.6 PART A - COST MANAGEMENT PRACTICES OF HEALTHCARE SECTOR IN KERALA

The aggregate cost management practices including cost control and cost reduction level has been analyzed to infer the prevailing level of cost management among the Modern Science hospitals in Kerala. The relevant data collected from the selected Modern science hospitals have been presented in Table 5.1.

Table 5.1: *Aggregate level of Cost Management*

FACTORS	AGGREGATE SCORE
Level of Cost planning	57.39 (23.48)
Level of Cost control	79.71 (20.34)
Level of Cost reduction	19.17 (13.74)
AGGREGATE	**52.09 (30.62)**

*Figures in brackets are the standard deviation.

Above Table 5.1 explains the level of cost management practices occupied by the Modern Science hospitals. Figures represent an aggregate mean score of 52 per cent for cost management being followed by the hospitals. While cost reduction has a mean score of 19 per cent as compared to cost control which has a mean score of 80 per cent. It further explains that cost management is followed alongside cost control but cost reduction measures needs drastic initiations.

5.6.1 Hospital type wise classification of level of cost management practiced by the hospitals

In order to understand the level of cost management practiced among hospitals and the cost control and reduction techniques aggregate data have been classified on the basis of type of hospital and presented in Table 5.2.

Table 5.2: *Analysis of hospitals' level of cost management on the basis of type wise classification*

Type / Factor	General	Multi	Aggregate Score	t Test (p-Value)
Cost planning	64.79 (19.42)	54.70 (24.37)	57.39 (23.48)	.071
Cost control	89.29 (14.80)	76.23 (21.04)	79.71 (20.34)	.006**
Cost reduction	18.75 (17.15)	19.32 (12.43)	19.17 (13.74)	.863
AGGREGATE	**57.61 (35.81)**	**50.08 (28.73)**	**52.09 (30.62)**	**.791**

*Figures in brackets are the standard deviation.
**Significant at 5% level.

Table 5.2 draws that General hospitals hold means score of 58 per cent as compared to Multi-specialty hospitals with a mean score of 50 per cent in case of level of cost management practiced. Moreover, better cost control measures are followed by General hospitals as compared to Multi – specialty hospitals with a mean score of 89 per cent and 76 per cent, respectively.

Further analysis is done to prove whether their variations between the types of hospitals show significant difference. It is statistically proven using t Test that the level of cost management variations does not show a significant difference at 5% level of significance, with a ‘p value’ more than 0.05.However, in the case of cost control techniques significant variations exists between General and Multi-specialty hospitals.

5.6.2 Hospital Quality Accreditation wise classification of level of cost management practiced by the hospitals

For an in-depth conception the level of cost management practiced among hospitals have been further analyzed classifying the aggregate data on the basis of quality accreditation of hospitals and presented in Table 5.3.

Table 5.3: *Analysis of hospitals' level of cost management on the basis of Quality Accreditation.*

Quality Accredited / Factor	Accredited	Non Accredited	Aggregate Score	t Test (p-Value)
Cost planning	59.17 (22.20)	50.28 (27.57)	57.39 (23.48)	.152
Cost control	81.00 (20.78)	79.39 (20.37)	79.71 (20.34)	.766
Cost reduction	20.00 (12.25)	18.96 (14.17)	19.17 (13.74)	.775
AGGREGATE	**53.39 (30.91)**	**49.54 (30.22)**	**52.09 (30.62)**	**.885**

*Figures in brackets are the standard deviation.

Table 5.3 reveals that, among the 17 hospitals Quality Accredited hospitals and 73 hospitals Quality Non – Accredited hospitals, the level of cost management is higher for Quality Accredited hospitals as to that of Quality Non - Accredited hospitals with a mean score of 53 per cent as compared to that of Quality Non – Accredited hospitals with a mean score of 50 per cent. This variation may be seemingly be upheld on the criteria of better scientific method of cost method.

Analytically, it has been proven statistically using t Test that there is no significant difference between the Quality Accredited hospitals and Non – Quality Accredited hospitals in case of the variances between the two classification, proving a 'p value' more than 0.05, at 5% significant level.

5.6.3 Region wise classification of level of cost management practiced by the hospitals

Aggregate data have been classified region wise to analyse the level of cost management practiced among the hospitals.

Table 5.4: *Analysis of hospitals' level of cost management on the basis of region wise classification*

Region / Factor	North	Central	South	Aggregate Score	ANOVA (p-Value)
Cost planning	57.00 (25.25)	58.71 (21.33)	56.47 (24.64)	57.39 (23.48)	.926
Cost control	82.32 (16.71)	83.87 (16.85)	74.00 (24.49)	79.71 (20.34)	.111
Cost reduction	19.80 (5.49)	20.65 (12.76)	17.35 (18.27)	19.17 (13.74)	.611
AGGREGATE	**53.04 (31.44)**	**54.41 (31.83)**	**49.27 (29.00)**	**52.09 (30.62)**	**.978**

*Figures in brackets are the standard deviation.

As per the Table 5.4, level of cost management among the hospitals has a higher mean score in the central region as compared to north and south regions. Among the three regions, Central region has the highest level of cost management practiced with a mean score of 54 per cent as compared to north region with 53 per cent and south region with the least mean score of 49 per cent.

It has been statically proven through One-way ANOVA that there is no significant difference region wise with a 'p value' more than 0.05, at 5% level of significance.

5.6.4 Bed size wise classification of level of cost management practiced by the hospitals

The aggregate data have been classified on the basis of bed capacity to analyse the level of cost management practiced among the hospitals.

Table 5.5: *Analysis of hospitals' level of cost management on the basis of bed size wise classification*

Bed Size / Factor	Up to 100 Beds	101 – 300 Beds	301 – 500 Beds	501 and above Beds	Aggregate Score	ANOVA (p-value)
Cost planning	59.56 (21.45)	60.67 (24.02)	48.85 (24.08)	15.00 (7.07)	57.39 (23.48)	.024**
Cost control	83.49 (18.60)	76.23 (21.65)	79.23 (20.71)	50.00 (9.90)	79.71 (20.34)	.079
Cost reduction	18.89 (13.14)	20.83 (13.27)	17.69 (17.87)	10.00 (0.00)	19.17 (13.74)	.689
AGGREGATE	**53.98 (32.66)**	**52.57 (28.57)**	**48.59 (30.77)**	**25.00 (21.79)**	**52.09 (30.62)**	**.596**

*Figures in brackets are the standard deviation.
**Significant at 5% level.

From the table it can be noticed that the aggregate cost management practiced is highest in the case of up to 100 bedded hospitals (54%) and lowest (25%) among 501 beds and above bedded hospitals. Similarly, in case of cost reduction, hospitals having bed size of 501 and above has the least mean score of 10 per cent as compared to that of hospitals with bed size of 101 to 300

beds. The interpretations reflects that volume of patients or economies of scale count difference in cost management.

Statistically, using One-way ANOVA it has been proven that there significant difference in the variations based on level of management and bed size of hospitals, with a 'p value' less than 0.05.

Table 5.6: *Post Hoc Test (Tukey HSD)*

Dependent Variable	(I) BED	(J) BED	Mean Difference (I-J)	Std. Error	Sig.
Planning	0 - 100	101 - 300	-1.111	5.331	.997
		301 - 500	10.709	7.121	.440
		501 and above	44.556*	16.343	.038*
	101 - 300	0 - 100	1.111	5.331	.997
		301 - 500	11.821	7.509	.399
		501 and above	45.667*	16.516	.034*
	301 - 500	0 - 100	-10.709	7.121	.440
		101 - 300	-11.821	7.509	.399
		501 and above	33.846	17.178	.207
	501 and above	0 - 100	-44.556*	16.343	.038*
		101 - 300	-45.667*	16.516	.034*
		301 - 500	-33.846	17.178	.207

*. The mean difference is significant at the 0.05 level.

In the Table 5.6, Post Hoc comparisons evaluates pairwise differences among the group means using Tukey HSD test since equal variances were tenable. Tests revealed significant pairwise differences between the mean score in case of hospitals with bed

size upto 100 beds and 501 beds and above with the 'p value' less than 0.05. Moreover, the comparison in the case of 101 to 300 beds and 501 beds and above shows significance with 'p value' less than 0.05, at 5 % level of significance.

5.6.5 Hospital Bed occupancy rate wise classification of level of cost management practiced by the hospitals

The below aggregate data has been classified on the basis of bed occupancy rate to analyse the level of cost management practiced among the hospitals.

Table 5.7: *Analysis of hospitals' level of cost management on the basis of bed occupancy rate wise classification*

Bed Occupancy Rate / Factor	**1 – 25%**	**25% - 50%**	**50% - 75%**	**75% - 100%**	**Aggregate Score**	**ANOVA (p-Value)**
Cost planning	53.00 (25.98)	56.88 (24.40)	64.17 (19.87)	55.00 (22.91)	57.39 (23.48)	.387
Cost control	75.96 (27.25)	79.21 (19.33)	85.79 (12.73)	77.35 (18.28)	79.71 (20.34)	.361
Cost reduction	21.00 (20.57)	15.83 (7.47)	20.83 (13.57)	18.82 (6.74)	19.17 (13.74)	.535
AGGREGATE	**49.99 (27.60)**	**50.64 (32.15)**	**56.93 (33.08)**	**50.39 (29.54)**	**52.09 (30.62)**	**.831**

*Figures in brackets are the standard deviation.

It is very clear from the above Table 5.7 that the aggregate level of cost management practiced has a highest mean score for the hospitals with bed occupancy rate of 50% to 75% with 57 per cent as compared to hospitals with bed occupancy rate of 1% to 25% with a mean score of 50 per cent. Cost control measure carries

highest mean score of 86 per cent for the hospitals with bed occupancy rate of 50% to 75% as compared to hospitals with bed occupancy rate of 1% to 25% having least mean score of 76 per cent.

The variation among the hospitals have been statistically analyzed using One-way ANOVA which proves that there is no significant difference between the categorized bed size hospitals, with the 'p value' more than 0.05, at 5% level of significance.

5.6.6 Hospital years of establishment wise classification of level of cost management practiced by the hospitals

For a better understanding, the aggregate data have been classified on the basis of years of establishment to analyse the level of cost management practiced among the hospitals.

Table 5.8: *Analysis of hospitals' level of cost management on the basis of years of establishment*

Years / Factor	1 – 25 yrs	26 – 50 yrs	51–75 yrs	76–100 yrs	Aggregate Score	ANOVA (p-value)
Cost planning	58.49 (24.97)	55.39 (22.40)	55.00 (19.75)	71.67 (27.54)	57.39 (23.48)	.680
Cost control	77.44 (23.54)	80.45 (18.14)	85.83 (9.17)	90.67 (8.08)	79.71 (20.34)	.580
Cost reduction	21.63 (18.12)	16.45 (7.25)	19.17 (6.65)	18.33 (12.58)	19.17 (13.74)	.417
AGGREGATE	**41.39 (32.66)**	**50.76 (32.25)**	**53.33 (33.36)**	**60.22 (37.50)**	**52.09 (30.62)**	**.986**

*Figures in brackets are the standard deviation.

Through the years of establishment, whether any difference in the level of cost management is observed under the Table 5.8.

The above table discreens that the hospitals with established years of 76 years to 100 years have the highest mean score of 60 per cent compared to hospitals with 1 year to 25 years having the lowest mean score of 42 per cent.

A higher level of cost reduction is visible among the hospitals with 1 year to 25 years of establishment with a mean score of 22 per cent as compared to that of hospitals with 26 years to 50 years of establishment having a mean score of 17 per cent.

For analysing whether there is any significant variation statistically, One-way ANOVA is used which proved that there is no significant difference between the years of establishment and the level of cost management practiced, with a ‘p value’ more than 0.05, at 5% level of significance.

5.6.7 Hospital adoption of periodic cost management practiced wise classification of level of cost management practiced by the hospitals

For an in-depth understanding of the level of cost management practiced among the hospitals, the aggregate data have been classified on the basis of adoption of cost management practiced.

Table 5.9: *Analysis of hospitals' level of cost management on the basis of adoption of periodic cost management*

Periodicity / Factor	Practiced	Unpracticed	Aggregate Score	t Test (p-Value)
Cost planning	58.77 (22.57)	51.47 (26.97)	57.39 (23.48)	.251
Cost control	82.00 (16.91)	69.88 (29.81)	79.71 (20.34)	.123
Cost reduction	19.38 (13.89)	18.24 (13.46)	19.17 (13.74)	.758
AGGREGATE	**46.53 (26.17)**	**41.79 (34.73)**	**52.09 (30.62)**	**.787**

*Figures in brackets are the standard deviation.

Table 5.9 describes that hospitals practicing periodic cost management has an aggregate mean score of 47 per cent as that of unpracticed hospitals having a mean score of 42 per cent. Moreover, cost reduction involve a mean score of 19 per cent for hospitals adopting cost management practices as that of hospitals not adopting cost management practices having a mean score of 18 per cent.

The variation among the hospitals were further statistically analysed using t Test which proved that there is no significant difference between the adoption of cost management practices at 5% level of significance, with a p value more than 0.05.

This section of the chapter concludes that the hospitals carry cost management practices of around 52%, signifying aggregate cost planning of 57 per cent, cost control measures of 80 per cent and cost reduction of around 19 per cent. Furthermore, it is clearly visible that there is no marked difference in this respect between type of hospital, bed capacity of the hospital, quality accreditation, bed occupancy ratio, adoption of cost management practices, region wise classification and years of establishment.

5.7 Cost management practiced based on various classification

Cost management has been explained for the study on the basis of four factors namely, cost relevance, cost planning, cost critical and cost appropriation methods. Table 5.10 brings a detailed description of the classification of cost management criteria and their statistical significance. The basis of classifications are type of hospital, quality accreditation of the hospital, region classification, bed size, bed occupancy rate and years of establishment.

Table 5.10: *Analysis of Cost Management on the basis of various classification*

COST MGT		Cost Relevance		Cost Planning		Cost Critical		Cost Appropriation Method		Aggregate Score	
Type	General	5.67 (1.13)	t Test (0.465)	5.08 (1.41)	t Test (0.010*)	3.96 (2.01)	t Test (0.150)	3.83 (1.37)	t Test (0.830)	**4.64 (0.89)**	t Test (0.799)
	Multi	5.47 (1.13)		4.08 (1.68)		3.29 (1.61)		3.76 (1.51)		**4.15 (0.94)**	
Quality Accreditation		5.60 (1.10)	t Test (0.728)	4.30 (1.84)	t Test (0.893)	3.05 (1.19)	t Test (0.129)	3.59 (1.85)	t Test (0.446)	**4.24 (1.05)**	t Test (0.503)
Non Accredited		5.50 (1.14)		4.36 (1.62)		4.00 (1.56)		3.71 (1.45)		**4.29 (0.87)**	
	North	5.26 (1.10)	ANOVA (0.317)	4.11 (1.40)	ANOVA (0.499)	3.22 (1.28)	ANOVA (0.343)	3.96 (1.29)	ANOVA (0.121)	**4.14 (0.84)**	ANOVA (0.937)
	Central	5.57 (0.82)		4.27 (1.74)		3.30 (1.51)		4.07 (1.48)		**4.30 (0.94)**	
	South	5.70 (1.36)		4.61 (1.80)		3.82 (2.19)		3.36 (1.54)		**4.37 (1.02)**	
Bed size	0 - 100	5.56 (1.18)	ANOVA (0.013*)	4.73 (1.67)	ANOVA(0.111)	3.62 (1.96)	ANOVA (0.562)	3.87 (1.44)	ANOVA (0.546)	**4.45 (0.88)**	ANOVA (0.085)
	101 – 300	5.57 (0.86)		3.90 (1.67)		3.30 (1.51)		3.50 (1.50)		**4.07 (1.03)**	
	301 - 500	5.69 (1.18)		4.23 (1.48)		3.54 (1.51)		4.15 (1.57)		**4.40 (0.91)**	
	Above 500	3.00 (0.00)		3.00 (0.00)		2.00 (0.00)		3.50 (0.71)		**2.88 (0.63)**	
Bed Occupancy rate	0% - 25%	3.80 (1.71)	ANOVA (0.990)	5.48 (1.26)	ANOVA (0.702)	4.12 (1.69)	ANOVA (0.512)	3.32 (1.95)	ANOVA (0.925)	**4.18 (0.93)**	ANOVA (0.546)
	25 – 50	3.63 (1.50)		5.58 (1.18)		4.54 (1.74)		3.71 (1.88)		**4.37 (0.91)**	
	5 - 75%	3.92 (1.28)		5.50 (1.18)		4.54 (1.67)		3.71 (1.78)		**4.42 (0.80)**	
	75% - 100%	3.76 (1.39)		5.53 (0.80)		4.12 (1.58)		3.00 (1.00)		**4.10 (1.06)**	

COST MGT	Cost Relevance		Cost Planning		Cost Critical		Cost Appropriation Method		Aggregate Score	
Years of 0 -25	3.95 (1.57)	ANOVA (0.597)	5.56 (1.16)	ANOVA (0.131*)	4.58 (1.71)	ANOVA (0.073)	3.74 (1.88)	ANOVA (0.544)	**4.46 (0.82)**	ANOVA (0.225)
26 – 50	3.53 (1.31)		5.42 (1.11)		4.13 (1.58)		3.08 (1.42)		**4.04 (1.02)**	
51 -75	4.31 (1.47)		5.50 (1.05)		3.33 (1.03)		3.00 (1.27)		**4.00 (1.11)**	
76 – 100	3.67 (2.08)		6.33 (1.56)		5.67 (2.31)		5.33 (2.89)		**5.25 (1.13)**	
AGGREGATE SCORE	**5.52 (1.12)**		**4.34 (1.66)**		**3.47 (1.74)**		**3.78 (1.47)**		**4.28 (0.90)**	

Above table explores that the aggregate score for cost relevance is 5.52 out of 7, in case of cost planning it is 4.34 out of 7, for cost critical the mean score is 3.47 out of 7 and cost appropriation methods involve 3.78 out of 7. The aggregate score showed 4.28 out of 7 which interprets that there exist around 61% level of cost control among the hospitals.

Furthermore, the classification on the basis of type of hospital shows that cost planning scored 5.08 in case of general hospital and 4.08 in case of multi-specialty hospitals. The difference when statistically tested using t test proved significant, with ‘p value’ less than 0.05, at 5% level of significance.

Similarly, under the classification of bed capacity, it can be noted that cost relevance in case of hospitals with bed capacity 0 to 100 is 5.56, for 101 to 300 beds 5.57. for hospitals with 301 to 500 beds is 5.69 and for hospitals with bed size above 500 is 3.00, the

differences were further proved significant using One-way ANOVA, with 'p value' less than 0.05, at 5% level of significance.

This part of the study further analyses the prevailing cost management practices followed by the hospitals through the following criteria:

Cost Reduction	Cost Control
➢ Bulk Purchase	Value Engineering
➢ Alternative Material	Benchmarking
➢ Alternative Labour	Responsibility Centre
➢ Value Analysis	Outsourcing

5.7.1 Analysis of Cost control techniques among the Modern Science hospitals in Kerala

An analysis into the technique of cost control have been further analysed and tabulated in the Table 5.11 Various factors that form part of cost control mechanism has been presented, the data was collected in 7 point scale.

Table 5.11: *Analysis of hospitals' cost control techniques*

COST CONTROL / **FACTOR**	**Aggregate Score**
Value Engineering	5.43 (1.85)
Benchmarking	3.73 (1.88)
Responsibility Centre	6.62 (0.49)
Outsourcing	4.51 (1.76)
AGGREGATE	**5.07 (1.24)**

*Figures in brackets are the standard deviation.

As above Table 5.11 discreens the various techniques that are involved in the cost control mechanism followed among the hospitals with an aggregate mean score of 5.07 (72%) out of 7.

5.7.2 Analysis of Cost control techniques based on various classifications

Cost management dimensions include cost control and cost reduction which has also been analysed for the study. Value Engineering. Responsibility centre, benchmarking and outsourcing have been analysed as the techniques for the cost control. Below Table 5.12 describes the classification of cost control criteria and their statistical significance. The basis of classifications are type of hospital, quality accreditation of the hospital, region classification, bed size, bed occupancy rate and years of establishment.

Table 5.12: *Analysis of Cost control on the basis of various classification*

Cost Control	Value Engineering		Responsibility Centre		Benchmarking		Outsourcing		**AGGREGATE SCORE**	
Type General	4.92 (1.59)	t Test (0.085)	6.54 (0.51)	t Test (0.164)	5.33 (1.88)	t Test (0.898)	3.50 (2.20)	t Test (0.285)	**5.07 (1.25)**	**t Test (0.804)**
Multi	4.36 (1.81)		6.65 (0.48)		5.47 (1.85)		3.83 (1.84)		**5.08 (1.25)**	
Quality Accreditation	5.15 (1.53)	t Test (0.125)	6.55 (0.51)	t Test (0.259)	6.00 (1.56)	t Test (0.094)	3.50 (1.91)	t Test (0.903)	**5.30 (1.33)**	**t Test (0.951)**
Non Accredited	4.33 (1.79)		6.64 (0.48)		5.27 (1.90)		3.80 (1.89)		**5.01 (1.25)**	

Cost Control		Value Engineering		Responsibility Centre		Benchmarking		Outsourcing		**AGGREGATE SCORE**	
	North	5.17 (1.60)	ANOVA (0.000*)	6.47 (0.51)	ANOVA (0.084)	5.67 (2.07)	ANOVA (0.469)	4.23 (1.52)	ANOVA (0.079)	**5.39 (0.94)**	**ANOVA (0.919)**
	Central	5.11 (1.12)		6.74 (0.45)		5.56 (1.48)		3.85 (1.68)		**5.32 (1.19)**	
	South	3.42 (1.84)		6.67 (0.48)		5.12 (1.92)		3.18 (2.21)		**4.60 (1.63)**	
Bed size	0 - 100	4.73 (1.67)	ANOVA (0.643)	6.62 (0.49)	ANOVA (0.645)	5.76 (1.67)	ANOVA (0.174)	3.56 (1.94)	ANOVA (0.570)	**5.17 (1.32)**	**ANOVA (0.757)**
	101 – 300	4.37 (1.94)		6.57 (0.50)		5.07 (2.15)		4.00 (1.88)		**5.00 (1.14)**	
	301 - 500	4.08 (1.80)		6.77 (0.44)		4.92 (1.61)		3.54 (1.81)		**4.83 (1.41)**	
	Above 500	4.50 (0.71)		6.50 (0.71)		7.00 (0.00)		5.00 (1.41)		**5.75 (1.19)**	
Bed Occupancy rate	0% - 25	4.48 (2.00)	ANOVA (0.922)	6.52 (0.51)	ANOVA (0.094)	5.16 (1.89)	ANOVA (0.508)	3.72 (2.05)	ANOVA (0.924)	**4.97 (1.19)**	**ANOVA (0.996)**
	25 – 50	4.33 (1.86)		6.54 (0.51)		5.92 (1.86)		3.87 (1.85)		**5.17 (1.27)**	
	5 - 75%	4.58 (1.56)		6.83 (0.38)		5.29 (1.88)		3.79 (1.93)		**5.12 (1.29)**	
	75% - 100%	4.71 (1.65)		6.59 (0.51)		5.35 (1.77)		3.47 (1.74)		**5.03 (1.30)**	
Years of	0 -25	4.48 (2.00)	ANOVA (0.557)	6.52 (0.51)	ANOVA (0.213)	5.16 (1.89)	ANOVA (0.824)	3.72 (2.05)	ANOVA (0.662)	**4.97 (1.19)**	**ANOVA (0.996)**
	26 – 50	4.33 (1.86)		6.54 (0.51)		5.92 (1.86)		3.87 (1.85)		**5.17 (1.27)**	
	51 -75	4.58 (1.56)		6.83 (0.38)		5.29 (1.88)		3.79 (1.93)		**5.12 (1.29)**	
	76 – 100	4.71 (1.65)		6.59 (0.51)		5.35 (1.77)		3.47 (1.74)		**5.03 (1.30)**	
AGGREGATE SCORE		**4.51 (1.76)**		**6.62 (0.49)**		**5.43 (1.85)**		**3.73 (1.89)**		**5.07 (1.24)**	

Cost control has been pointed out on the basis of four criteria. Under the classification region wise distribution of the cost control criteria value engineering, the mean score for north region is 5.17, central 5.12 and south region is 3.42. The difference in variation is statistically analysed using One-way ANOVA, which proved that there is significant difference with 'p value' less than 0.05, at 5% level of significance.

The aggregate mean score for value engineering is 4.51 (64.43%), responsibility centre is 6.62 (94.57%), benchmarking 5.43 (77.57%) and outsourcing is 3.73 (53.29%). The aggregate score showed 5.07 out of 7 (72.43%) which interprets that there exist higher level of cost control among the hospitals.

5.7.3 Analysis of Cost reduction techniques among the Modern Science hospitals in Kerala

An in depth analysis of cost reduction techniques have been analysed and presented in the Table 5.13. Various factors that form part of cost reduction mechanism has been have been tabulated, 7 point scale has been utilized for collecting the data.

Table 5.13: *Analysis of hospitals' cost reduction techniques*

COST REDUCTION FACTOR	**AGGREGATE SCORE**
Value Analysis	1.68 (1.51)
Bulk Purchase	5.51 (1.46)
Alternative Labour	4.21 (2.14)
Alternative Material	5.31 (1.40)
AGGREGATE	**4.18 (1.76)**

Table 5.13 shows the aggregate cost reduction mean score of 4.18 (60%) out of 7, tabulating various techniques of cost reduction.

This section integrates the cost management on the basis of cost control and cost reduction aspects. Various factors of cost reduction technique and cost control technique has been interpreted. Further reveals that there is 72% cost control mechanism being followed and 60% cost reduction mechanism being followed by the hospitals of the study.

5.7.4 Analysis of Cost reduction techniques based on various classifications

Cost reduction is a tool to measure the effective combination of the factors of management. Controls may be used to measure time, quality and cost. Cost reduction for the study has been explained on the basis of six factors namely, better cost, cost record, value analysis, alternate material, alternate labour and bulk purchase. Table 5.14 brings a detailed description of the classification of cost management criteria and their statistical significance. The basis of classifications are type of hospital, quality accreditation of the hospital, region classification, bed size, bed occupancy rate and years of establishment.

Table 5.14: *Analysis of Cost reduction techniques on the basis of various classification*

Cost Reduction		Better Cost		Cost Record		Value Analysis		Alternate Material		Bulk Purchase		Alternate Labour		**Aggregate Score**	
Type	General	6.08 (0.78)	t Test (0.014*)	5.71 (1.40)	t Test (0.300)	2.00 (1.93)	t Test (0.015*)	5.63 (1.25)	t Test (0.542)	5.88 (1.36)	t Test (0.544)	3.83 (2.18)	t Test (0.827)	**4.86 (1.62)**	t Test **(0.779)**
	Multi	5.62 (1.29)		5.44 (1.55)		1.58 (1.33)		5.12 (1.38)		5.44 (1.48)		4.35 (2.12)		**4.59 (1.54)**	
Quality	Accreditation	5.45 (1.47)	t Test (0.038*)	5.75 (1.21)	t Test (0.313)	1.60 (1.23)	t Test (0.301)	5.05 (1.43)	t Test (0.722)	5.25 (1.74)	t Test (0.080)	4.85 (1.90)	t Test (0.154)	4.66 (1.53)	t Test **(0.999)**
Non	Accredited	5.83 (1.10)		5.44 (1.59)		1.71 (1.59)		5.31 (1.34)		5.64 (1.36)		4.03 (2.18)		4.66 (1.58)	
	North	5.78 (1.05)	ANOVA (0.968)	6.00 (1.07)	ANOVA (0.003*)	1.63 (1.45)	ANOVA (0.158)	5.15 (0.91)	ANOVA (0.827)	5.26 (1.46)	ANOVA (0.001*)	4.56 (1.63)	ANOVA (0.001*)	4.73 (1.60)	**ANOVA (0.984)**
	Central	5.70 (1.18)		5.83 (1.05)		1.33 (1.16)		5.23 (1.36)		5.03 (1.59)		5.07 (2.08)		4.70 (1.68)	
	South	5.76 (1.32)		4.82 (1.90)		2.06 (1.78)		5.36 (1.66)		6.27 (1.01)		3.15 (2.17)		4.57 (1.63)	
Bed size	0 – 100	5.91 (1.02)	ANOVA (0.003*)	5.76 (1.57)	ANOVA (0.482)	1.78 (1.76)	ANOVA (0.347)	5.31 (1.41)	ANOVA (0.966)	5.64 (1.40)	ANOVA (0.860)	4.04 (2.13)	ANOVA (0.303)	**4.74 (1.60)**	**ANOVA (0.976)**
	101 – 300	5.53 (1.25)		5.30 (1.37)		1.37 (0.93)		5.17 (1.42)		5.50 (1.57)		4.50 (2.15)		**4.56 (1.61)**	
	301 - 500	6.08 (1.12)		5.15 (1.57)		1.92 (1.50)		5.23 (1.17)		5.31 (1.55)		3.77 (2.17)		**4.58 (1.50)**	
	Above 500	5.50 (2.12)		3.00 (0.00)		3.00 (2.83)		5.50 (0.71)		6.00 (0.00)		6.50 (0.71)		**4.92 (1.53)**	

Cost Reduction	Better Cost		Cost Record		Value Analysis		Alternate Material		Bulk Purchase		Alternate Labour		**Aggregate Score**	
Bed Occupancy rate 0% - 25%	5.72 (1.28)	ANOVA (0.996)	5.20 (1.89)	ANOVA (0.583)	1.92 (1.80)	ANOVA (0.762)	5.00 (1.58)	ANOVA (0.351)	5.88 (1.45)	ANOVA (0.261)	3.80 (2.40)	ANOVA (0.349)	**4.90 (1.39)**	**ANOVA (0.990)**
25 – 50	5.75 (1.39)		5.46 (1.47)		1.75 (1.57)		5.67 (1.34)		5.75 (1.26)		4.08 (2.41)		**4.74 (1.60)**	
50 - 75%	5.79 (1.02)		5.71 (1.23)		1.50 (1.29)		5.21 (1.22)		5.38 (1.35)		4.21 (1.84)		**4.63 (1.64)**	
75% - 100%	5.71 (1.05)		5.76 (1.30)		1.53 (1.33)		5.12 (1.17)		5.06 (1.78)		5.00 (1.62)		**4.70 (1.59)**	
Years of 0 -25	5.63 (1.25)	ANOVA (0.587)	5.63 (1.62)	ANOVA (0.573)	2.02 (1.83)	ANOVA (0.235)	5.21 (1.39)	ANOVA (0.624)	6.02 (1.24)	ANOVA (0.004*)	4.40 (2.05)	ANOVA (0.755)	**4.76(1.51)**	**ANOVA (0.990)**
26 – 50	5.79 (1.09)		5.29 (1.49)		1.34 (1.02)		5.34 (1.21}		4.92 (1.55)		4.03 (2.21)		**4.45 (1.63)**	
51 -75	6.33 (0.52)		5.67 (0.82)		1.67 (1.63)		5.50 (1.64)		5.83 (0.98)		4.50 (2.59)		**4.92 (1.70)**	
76 – 100	5.67 (2.31)		6.33 (1.16)		1.33 (0.58)		4.33 (2.31)		6.33 (1.16)		3.33 (2.31)		**4.55 (1.98)**	
AGGREGATE SCORE	**5.74 (1.19)**		**5.51 (1.51)**		**1.69 (1.51)**		**5.26 (1.35)**		**5.56 (1.45)**		**4.21 (2.14)**		**4.66 (1.56)**	

Above table explores that the aggregate score for better cost is 5.74 out of 7, in case of cost record is 5.51 out of 7, for value analysis the mean score is 1.69 out of 7, alternate material involve 5.26 out of 7, bulk purchase is 5.56 out of 7 and alternate labour is 4.21.The aggregate score showed 4.66 out of 7 which interprets that there exist around 67% level of cost control among the hospitals.

The classification on the basis of type of hospital shows that the value analysis scored 2.00 in case of General hospital and 1.58 in case of Multi-specialty hospitals. The difference when statistically tested using t test proved significant, with ‘p value’ less than 0.05, at 5% level of significance. Under the classification of bed occupancy rate, it can be noted that the factor bulk purchase shows a mean score of 5.88 for hospitals with bed occupancy 0% to 25% and 5.06 for the hospitals with bed occupancy rate 75% to 100%. To further analyse the variation. The differences were statistically tested using One-way ANOVA, which does not prove significant as the ‘p value’ is more than 0.05, at 5% level of significance.

5.8 PART B – AWARENESS LEVEL OF ACTIVITY BASED COSTING

This part of the chapter, analyses the awareness level of Activity Based Costing technique among Modern Science hospitals.

5.8.1 Cost Driver identification in the hospital sector

In this section, cost drivers are examined with a view to pinpoint the most severe pressures by health category. Cost driver measures the frequency and the intensity of demand on the activities by cost objects. It is used for assigning activity cost to cost objects consuming the activity.

Costing of services through identified basic services that fulfill healthcare in the hospitals namely, consultation services, laboratory services, radiology services and operation theatre services also form part of the study. Basically, the services identified may be classified as medical services and medical support services. Consultation service and Operation theatre service include medical services. Laboratory services and radiology services form part of medical support services.

Table 5.15 illustrates the cost drivers for the identified medical and medical support services.

Table 5.15: *Cost drivers of various Medical and Medical support services*

Sl. No.	Services / Cost Driver	Cost Driver 1	Cost Driver 2
1.	Consultation	Time	Number of patients
2.	Laboratory	Time	Reagent Cost
3.	Radiology	Number of Exposure	Number of Films
4.	Operation Theatre	Anesthesia duration	Number of Surgeries

The table shows two cost drivers for each of the services that are mentioned according to their intensity in cost analysis.

Consultation Service cost

Consultation services draws time as its major element for cost analysis. The time utilized by the physician to diagnose the patient has been entitled as an element of cost driver. Time spend for each patient results as a factor for cost of consultation service. To trigger an accuracy in cost statement for the service, time is a well-established cost driver. Another cost driver for consultation service is volume, i.e. the number of patients as one among its cost driver. The number of patients both Out Patient and In Patient is included as a cost driver to analyze the cause of cost for the service. Interpreting economies of scale, volume plays a vital role in cost reduction.

Laboratory Service cost

Laboratory services cost are underlined by the time consumed to perform the test. For each type of test, whether biochemistry, hematology, clinical pathology or others the cost incurred in the different phases, from the phlebotomy phase to the reporting stage, time involves as a major factor for cost. Reagent cost also enhances as a cost driver for laboratory services. Moreover, reagent cost summarizes the basic factor of cost for any peculiar test.

Radiology Service cost

Radiology services cost are drawn by the number of exposures conducted. Different extremities image through x-ray are dealt as the cost driver for analyzing the cost for the X-ray service. The number of films utilized for examining the service also form part as a cost driver for the service.

Operation Theatre Service cost

Operation theatre service cost is drawn by the time taken for the surgery, in other words, the anesthesia duration plays a vital role in surfacing the cost of a surgery. Various factors of charge are summed up the duration of the surgery. Number of surgeries also coincide the operation theatre service cost.

5.8.2 Awareness, Interest and Implementation of Activity Basted Costing

ABC is a closed loop model, a continuous process for setting a plan to actual performance with new insights for betterment. The strength of the model is that involves both sides i.e. resources planning and control. The rationale behind ABC is that the attention can be focused on the value-adding activities while non- value adding activities can be eliminated in the future.

The researcher here examines the awareness level of hospitals about the costing technique - Activity Based Costing. Sustenance for the hospitals through the existing cut-throat competition is possible only through a better management module. Cost reduction and control are recognized as a better measure of financial viability. The study explores the Activity Based Costing technique's awareness, interest, implementation level and activity analysis among the 90 hospitals selected as the sample for the study. A structured interview schedule of 7 point scale has been utilized for collecting the data. To get much accurate information from the respondent and understanding the informants' higher knowledge capacity in this field, a 7 point scale has been made into use.

A process that improves techniques to evaluate the outcome i.e. cost and quality can be summed as ABC. Whether the industry is aware of this costing technique is evaluated in this part of the

study. Interest in the following Activity Based Costing is also explored to understand the existence of ABC among hospitals in Kerala. Are the hospitals willing to implement such a technique or whether they are able to initiate this costing technique in their system of management is also explained in this part of the study. Does activity analysis form part of their management practices have also been assessed by the researcher.

The direct labourers in organizations are the employees who perform the frontline, repeated work that is closest to the products and consumers. However, numerous other employees behind the frontline also do recurring work on a daily or weekly basis. Many ABC practitioners wish the word allocation never existed. It implies inequity to many people based on past abuses in their organization's accounting practices. The word allocation effectively means "misallocation" because that is usually the result. ABC technique do not allocate expenses; instead trace and assign them based on cause-and-effect relationships. ABC extends to the overhead, the understanding and visibility of spending that is already applied to the recurring labourers. ABC can then become an organization-wide technique of understanding work activity costs as well as the standard costs of output. The organization already has substantial visibility of its recurring costs, but it does not have any insights into its overhead or what is causing the level of spending of its overhead.

Activity analysis to be competitive, a firm must assess each of the activities based on its need by the product or consumer, its efficiency, and its value content. A firm performs an activity for one of the following reasons:

- It is required to meet the specifications of the product or service or satisfy consumer demand.
- It is required to sustain the organization
- It is deemed beneficial to the firm.

5.8.2.1 AGGREGATE AWARENESS LEVEL OF ACTIVITY BASED COSTING

Healthcare being under the service sector is greatly influenced by the need of labour cost. A drastic change can be felt in the labour cost over the years of exploration in this area. Technically, healthcare sector has grown tremendously and a relative overhead cost has become a borne in this sector. Unscientific management of overhead cost has penetrated into the profits of healthcare sector. Cost management has become vital to sustain this competition. Appropriation of overhead costing other words, a technique for rearranging overhead cost is essential. ABC has therefore become essentially evident.

A total sum of the factors leading to awareness about ABC and hospital sample of 90 has been analyzed in this part of the study.

Table 5.16: *Aggregate awareness level of Modern Science hospital in Kerala*

Factor	Aggregate Score
Awareness	4.84 (1.58)
Interest	3.72 (1.74)
Implementation	1.06 (0.23)
Activity Analysis	0.38 (0.09)
AGGREGATE	**2.50 (2.12)**

*Figures in the brackets are standard deviation

Table 5.16 explains the aggregate score of the hospital's awareness, interest, and implementation level of ABC technique. Aggregate hospitals' aggregate score about ABC technique is 2.50 out of 7 i.e. 35.71 per cent, while their awareness scored 4.84 out of 7 i.e. 69.14 per cent followed by their interest towards the ABC technique scored 3.72 out of 7 i.e. 53.14 per cent. The implementation phase showed a mean score of 1.06 out of 7 which represents 15.14 per cent. Whether activity analysis is being practiced in these hospitals showed a score of 0.38 out of 7, resulting in 0.05 per cent.

This explains the awareness level of the hospitals as an average while their interest regarding this technique shows poor performance, similarly their implementation level is too low. Activity analysis shows low traces, as a reflection of lesser interest and implementation capacity. Furthermore, it can observed that the awareness of ABC technique carry lesser significance in hospital costing.

5.8.2.2 Hospital type wise classification of the aggregate awareness level of Activity Based Costing

Data relating to awareness, interest and implementation is classified on the basis of type of hospitals and presented in Table 5.17.

Table 5.17: *Analysis of hospitals' awareness level of ABC technique on the basis of type of hospital*

Type / Factor	General	Multi	Aggregate Score	t Test (p-Value)
Awareness	5.13 (1.68)	4.74 (1.54)	4.84 (1.58)	0.312
Interest	3.58 (1.89)	3.77 (1.69)	3.72 (1.74)	0.650
Implementation	1.04 (0.20)	1.06 (0.24)	1.06 (0.23)	0.732
Activity analysis	0.58 (0.38)	0.17 (0.05)	0.38 (0.09)	0.110
AGGREGATE	**2.58 (2.15)**	**2.44 (2.17)**	**2.50 (2.12)**	**.926**

*Figures in the brackets are standard deviation

The table elaborates that general hospitals have a higher awareness level with a mean score of 2.58 out of 7 as compared to multi- specialty hospital with a mean score of 2.44 out of 7. With regard to the interest towards this costing technique, a similar preference is ascertained between the two groups having a mean score of 3.58 and 3.77 for general and multi-specialty hospitals, respectively.

The main cause for the least interest in ABC technique may be due to its least awareness and the complications in its implementation.

For ascertaining whither their variation is substantial, using t test it has been statistically proved that the differences are not significant as the 'p value' is more than 0.05, at 5% level of significance.

5.8.2.3 Hospital bed size wise classification of the aggregate awareness level of Activity Based Costing

Below sketches awareness level of hospital with regard to ABC technique under bed size classification of hospitals.

Table 5.18: *Analysis of hospitals' awareness level of ABC technique on the basis of bed size of hospital*

Bed Size / Factor	Up to 100 Beds	101 – 300 Beds	301 – 500 Beds	501 and above Beds	Aggregate Score	ANOVA (p-Value)
Awareness	4.89 (1.72)	4.93 (1.57)	4.62 (1.12)	4.00 (1.41)	4.84 (1.58)	0.81
Interest	3.76 (1.75)	3.73 (1.76)	3.69 (1.84)	3.00 (1.41)	3.72 (1.74)	0.95
Implementation	1.07 (0.25)	1.00 (0.00)	1.00 (0.00)	2.00 (0.00)	1.06 (0.23)	0.00**
Activity Analysis	0.44 (1.34)	0.17 (0.51)	1.00 (0.00)	0.20 (0.10)	0.38 (0.09)	0.51
AGGREGATE	**2.54 (2.13)**	**2.46 (2.24)**	**2.58 (1.86)**	**2.30 (1.62)**	**2.50 (2.12)**	**.997**

*Figures in the brackets are standard deviation
**Significant at 5% level.

Table 5.18 discreen with the bed classification of the hospitals its preference towards ABC. Through this classification, the category of 301 to 500 beds have a higher mean score of 2.58 out of 7, 36.86 per cent as compared to the category of 501 and above beds having a mean score of 2.30 out of 7 representing 32.86 per cent being the least. Regarding interest towards ABC, category of up to 100 beds have the highest mean score of 3.76 and the least for the category of 501 and above beds with a mean score of 3.

For a better understanding of the variances in classification, One-way ANOVA is used which statistically proved that there is significant difference between the different categories of bed size alongside the implementation phase of ABC, as the ‘p value’ is less than 0.05, at 5% level of significance. A further analysis to this variance is done by using Post Hoc test.

Table 5.19: *Post Hoc Test (Tukey HSD)*

Dependent Variable	(I) BED	(J) BED	Mean Difference (I-J)	Std. Error	Sig.
Implementation	0 - 100	101 - 300	.067	.043	.402
		301 - 500	.067	.057	.645
		501 and above	-.933*	.130	.000*
	101 - 300	0 - 100	-.067	.043	.402
		301 - 500	.000	.060	1.000
		501 and above	-1.000*	.132	.000*
	301 - 500	0 - 100	-.067	.057	.645
		101 - 300	.000	.060	1.000
		501 and above	-1.000*	.137	.000*
	501 and above	0 - 100	.933*	.130	.000*
		101 - 300	1.000*	.132	.000*
		301 - 500	1.000*	.137	.000*

* The mean difference is significant at 0.05 level.

The Table 5.19 Post Hoc comparisons evaluate pairwise differences among the categories of bed size mean scores with the implementation phase of ABC using Tukey HSD test since equal variances were tenable. Test revealed significant pairwise differences between the mean score of the category of bed size up to 100 beds and 501 and above beds in case of implementation preference of ABC. Similarly, in categories of 101 to 300 beds and 501 and above beds as the p value is less than 0.05, it proves that there is a comparable difference. Moreover, the bed size category

of 301 to 500 and 501 and above bed size category also shows a significant difference as the 'p value' establishes a less than 0.05 value.

5.8.2.4 Hospital periodic cost evaluation wise classification of the aggregate awareness level of Activity Based Costing

Periodic cost evaluation intensifies the concern for cost management in a hospital. Assessment of cost on a periodic basis enhances better cost management. Whether cost is evaluated periodically by the hospitals and whether any variation in the proportion of awareness of ABC among these hospitals based above said is analyzed in Table 5.20.

Table 5.20: *Analysis of hospitals' awareness level of ABC technique on the basis of periodic cost evaluation of hospital*

Periodicity / **Factor**	**Practiced**	**Unpracticed**	**Aggregate Score**	**t Test (p-Value)**
Awareness	4.79 (1.62)	5.06 (1.44)	4.84 (1.58)	0.537
Interest	3.73 (1.81)	3.71 (1.45)	3.72 (1.74)	0.966
Implementation	1.05 (0.23)	1.06 (0.24)	1.06 (0.23)	0.949
Activity Analysis	0.26 (0.20)	0.42 (0.46)	0.38 (0.09)	0.755
AGGREGATE	**2.15 (1.08)**	**2.19 (1.10)**	**2.50 (2.12)**	**.948**

*Figures in the brackets are standard deviation

Above Table illustrates the awareness level of Activity Based Costing among the hospitals which are not practicing periodic cost evaluation has a higher mean score awareness level as compared to the hospitals practicing periodic cost evaluation with a mean score of 5.06 and 4.79, respectively. With regard to the interest towards this costing technique, a similar preference is felt between the two groups with mean scores 3.73 and 3.71 for periodic cost evaluation practicing and non – practicing hospitals respectively. Furthermore, in case of implementation phase also a similar preference which proves very poor can be noticed in the table, pertaining mean score of 1.05 for periodic cost evaluation practicing hospitals and 1.06 for periodic cost evaluation non – practicing hospitals. Use of activity analysis also shares a poor preference among the categories of hospital.

When statistically analyzing the variations between the categories, t Test proved that there is no significant difference between the two categories of hospitals and their awareness level of ABC technique as the ‘p value’ proves more than 0.05, at 5% level of significance.

5.8.2.5 Hospital periodic cost evaluation wise classification of the aggregate awareness level of Activity Based Costing

Bed occupancy rate indicates how the available bed capacity has been utilized. A value equal to 100% would be ideal. A value less than 100% shows the unutilized capacity and a value

more than 100% show overcrowding. The data relating to ABC is classified on the basis of bed occupancy and presented in the table below.

Table 5.21: *Analysis of hospitals' awareness level of ABC technique on the basis of periodic cost evaluation of hospital*

Bed Occupancy Rate / Factor	**1 – 25%**	**25-50 %**	**50-75 %**	**75-100 %**	**Aggregate Score**	**ANOVA (p-Value)**
Awareness	5.44 (1.22)	5.43 (1.36)	4.07 (1.68)	4.36 (1.60)	4.84 (1.58)	0.001**
Interest	4.00 (1.57)	4.14 (1.49)	3.43 (1.93)	3.14 (1.88)	3.72 (1.74)	0.234
Implementation	1.04 (0.19)	1.05 (0.22)	1.07 (0.26)	1.07 (0.27)	1.06 (0.23)	0.943
Activity Analysis	0.48 (0.40)	0.29 (0.31)	0.21 (0.83)	1.00 (0.00)	0.38 (0.09)	0.592
AGGREGATE	**2.74 (2.37)**	**2.73 (2.45)**	**2.20 (1.85)**	**2.39 (1.65)**	**2.50 (2.12)**	**.978**

*Figures in the brackets are standard deviation
**Significant at 5% level.

It can be observed from the Table 5.21 that, hospitals having bed occupancy rate 1% to 25% and 25.01% to 50% shows a higher aggregate awareness level with a mean score of 2.74 and 2.73, respectively as compared to the hospitals with the bed occupancy rate 50.01% to 75% and 75.01% to 100% having mean score of 2.20 and 2.39, respectively. A similar preference is observed among all the categories of hospitals classified under bed occupancy rate in case of implementation phase, emphasizing a

very poor preference. Activity analysis is carried out mainly by the hospitals under the bed occupancy rate category of 1% to 25% show a very low mean score of 0.48 and its least by the category with bed occupancy rate 50.01% to 75% having mean score 0.21.

Statistically, the difference in the awareness about ABC and the categorization of bed occupancy rate of hospital is significant as the 'p values' proves less than 0.05, at 5 % significant level using One-way ANOVA. To further analyze this variance, Post Hoc test has been used.

Table 5.22: *Post Hoc test (Tukey HSD)*

Factor	(I) Occupancy	(J) Occupancy	Mean Difference (I-J)	Std. Error	Sig.
Awareness	1 - 25	25.01 - 50	.016	.427	1.000
		50.01 - 75	1.373*	.395	.004*
		75.01 - 100	1.087	.483	.118
	25.01 - 50	1 - 25	-.016	.427	1.000
		50.01 - 75	1.357*	.423	.010*
		75.01 - 100	1.071	.506	.156
	50.01 - 75	1 - 25	-1.373*	.395	.004*
		25.01 - 50	-1.357*	.423	.010*
		75.01 - 100	-.286	.480	.933
	75.01 - 100	1 - 25	-1.087	.483	.118
		25.01 - 50	-1.071	.506	.156
		50.01 - 75	.286	.480	.933

*Significant at 5% level.

Table 5.22 reflects Post Hoc comparisons evaluated pairwise i.e. the differences among the categories of bed occupancy rate with the awareness of ABC technique using Tukey HSD test. It is revealed that the significant pairwise difference between the mean score of the category of bed occupancy rate 1% to 25% and 50.01% to 75% shows a significant difference proving 'p value' less than 0.05. Similarly, in categories of 25.01% to 50% and 50.01% to 75% as the 'p value' is less than 0.05, it proves that there is a comparable difference.

5.8.2.6 Hospital quality accreditation wise classification of the aggregate awareness level of Activity Based Costing

Quality perhaps tame to be an integral part for the conclusion of any clinical outcome. Hospitals with quality accreditation inputs qualified staff, better clinical outcome and quality enhanced for the facilities provided. Below Table 5.20 classifies the sample of hospitals into quality accredited and those hospitals quality non – accredited.

Table 5.23: *Analysis of hospitals' awareness level of ABC technique on the basis of periodic quality accreditation of hospital*

Quality Accredited / Factor	Accredited	Non Accredited	Aggregate Score	t Test (p-Value)
Awareness	4.65 (1.31)	4.90 (1.65)	4.84 (1.58)	0.535
Interest	3.30 (1.72)	3.84 (1.73)	3.72 (1.74)	0.219
Implementation	1.10 (0.31)	1.04 (0.20)	1.06 (0.23)	0.331
Activity Analysis	0.38 (0.20)	0.36 (0.23)	0.38 (0.09)	0.018**
AGGREGATE	**2.36 (1.97)**	**2.53 (2.18)**	**2.50 (2.12)**	**.908**

*Figures in the brackets are standard deviation
**Significant at 5% level.

As per the table, the awareness level of hospitals as per classification shows that both the groups have a similar mean score of 4.65 and 4.90 for quality accredited and non – quality accredited hospitals. This proves that both the groups share an average awareness of the costing technique. With regard to the use of activity analysis shares a poor preference among both the classification of hospital with a mean score of 0.38 and 0.36 for Quality Accredited and Quality non – Accredited hospitals, respectively.

Statistically, t Test proves to be significantly different between the classifications of the hospitals and their activity

analysis, proving 'p value' less than 0.05, at 5% level of significance. Whereas, for the other factors, no significant difference is proved between Quality Accredited and Quality Non – Accredited hospitals.

5.8.2.7 Hospital region wise classification of the aggregate awareness level of Activity Based Costing

This part of the study examines region wise classification of Kerala alongside the awareness level of ABC in each region. The state Kerala has been categorized as three regions as per its formation wisely, North, Central and South.

Table 5.24: *Analysis of hospitals' awareness level of ABC technique on the basis of region classification of hospital*

Region / Factor	North	Central	South	Aggregate Score	ANOVA (p-Value)
Awareness	5.91 (1.16)	4.30 (1.69)	4.15 (1.20)	4.84 (1.58)	0.00**
Interest	4.36 (1.30)	4.43 (1.74)	2.15 (1.10)	3.72 (1.74)	0.00**
Implementation	1.06 (0.24)	1.03 (0.18)	1.07 (0.28)	1.06 (0.23)	0.79
Activity Analysis	0.58 (1.60)	0.43 (0.33)9	0.27 (0.19)	0.38 (0.09)	0.14
AGGREGATE	**2.98 (2.58)**	**2.55 (2.11)**	**1.91 (1.68)**	**2.50 (2.12)**	**.785**

*Figures in the brackets are standard deviation
**Significant at 5% level.

Above Table 5.24 illustrates through region wise classification, North region has a higher aggregate awareness level of 2.98 as compared to Central and South region having a mean score of 2.55 and 1.91, respectively. In case of the interest towards this costing technique, a similar preference can be observed between the North and Central region having a higher mean score of 4.36 and 4.43, respectively. In case of implementation phase also a similar preference is illustrated which proves very poor among the regions.

ANOVA proves statistically that there is a significant difference between the classified regions and their awareness level and interest towards ABC, proving 'p value' less 0.05, at 5% level of significance. A further analysis is done with the help of Post Hoc test to ensure its variance. While implementation phase and activity analysis shows no significant difference between region wise classifications, statistically proven through 'p value' more than 0.05, at 5% level of significance. A further analysis to understand the variation is done using Post Hoc test.

Table 5.25: *Post Hoc test (Tukey HSD)*

Dependent Variable	(I) Region	(J) Region	Mean Difference (I-J)	Std. Error	Sig.
Awareness	North	Central	1.609*	.345	.000*
		South	1.761*	.355	.000*
	Central	North	-1.609*	.345	.000*
		South	.152	.362	.908
	South	North	-1.761*	.355	.000*
		Central	-.152	.362	.908

Dependent Variable	(I) Region	(J) Region	Mean Difference (I-J)	Std. Error	Sig.
Interest	North	Central	-.070	.355	.979
		South	2.215*	.365	.000*
	Central	North	.070	.355	.979
		South	2.285*	.373	.000*
	South	North	-2.215*	.365	.000*
		Central	-2.285*	.373	.000*

* The mean difference is significant at 0.05 level.

Table 5.25 Post Hoc comparisons evaluates pairwise differences of region wise classification and ABC awareness and implementation phase mean scores using Tukey HSD test since equal variances were tenable. Test revealed significant pairwise differences between the mean score of North region to Central region and North region to South region in case of examining its ABC awareness level. Similarly, pairwise comparison in case of interest towards ABC technique, South region to North and Central region proves p value less than 0.05, ensuring a comparable difference.

5.8.2.8 Hospital years of establishment wise classification of the aggregate awareness level of Activity Based Costing

The sample of hospitals are classified under their years of establishment. Through the established years of the hospital, their awareness level of the ABC technique is evaluated in this part of the study.

Table 5.26: *Analysis of hospitals' awareness level of ABC technique on the basis of years of establishment of hospital*

Years / Factor	1-25 yrs	26-50 yrs	51-75 yrs	76-100 yrs	Aggregate Score	ANOVA (p-Value)
Awareness	5.14 (1.52)	4.58 (1.59)	4.33 (1.75)	5.00 (2.00)	4.84 (1.58)	0.36
Interest	3.42 (1.71)	3.95 (1.61)	3.67 (2.34)	5.33 (2.08)	3.72 (1.74)	0.21
Implementation	1.12 (0.32)	1.00 (0.00)	1.00 (0.00)	1.00 (0.00)	1.06 (0.23)	0.13
Activity Analysis	0.77 (1.25)	0.24 (1.03)	1.00 (0.00)	0.50 (0.12)	0.38 (0.09)	0.82
AGGREGATE	**2.61 (2.05)**	**2.44 (2.14)**	**2.50 (1.75)**	**2.96 (2.56)**	**2.50 (2.12)**	**.986**

*Figures in the brackets are standard deviation

Table 5.26 elaborates the various categorization of the hospitals on the basis of years of establishment and the factors for analyzing the aggregate awareness level of ABC. It is visible that the aggregate awareness level of ABC technique shows a mean score of 2.96 out of 7 in vase of hospitals having 76 years to 100 years of establishment as compared to the mean score of 2.44 for the hospitals having 26 years to 50 years of establishment.

For evaluating the variation statistically, One-way ANOVA is used which proves that there is no significant difference between the years of establishment of the hospitals and their ABC awareness level with a 'p value' more than 0.05, at 5% level of significance.

This chapter consolidates ABC awareness among the sample of hospitals and their level of activity analysis for various medical, medical support and non-medical services. The researcher further indicates that the aggregate awareness level of hospitals regarding ABC technique is around 36 per cent.

Reference

1. Hansen, D. and Mowen, M. (2003). *Cost Management: Accounting and Control*, Cengage Learning.

2. Brierley, J., Cowton, C., and Drury, C. (2007). The identification and type of costs used in cost reduction. *Journal of Cost Management, 21*(5), 34–39.

Chapter VI

HOSPITAL PERFORMANCE INDICATORS AND ANALYSIS OF EMPIRICAL RELATIONSHIP BETWEEN COST MANAGEMENTAND PERFORMANCE INDICATORS

After analyzing the cost management practices in this chapter the researcher has attempted to examine the empirical relation between adoption of cost management practices and the hospital performance in Kerala.

6.1 KEY PERFORMANCE INDICATORS

Performance of a hospital is judged by the medical outcome it attains. Performance is realized on the basis of the core services rendered. Quality is yet another element that forms the base for the performance. Certain indicators helps to analyze how far a hospital is medically fit, in other words the medical outcome it perceives.

Firstly, few indicators that form part of the hospital performance indicators and indicator based performance of the selected hospitals are explained, as below.

6.1.1. Bed Turn Over Rate (TOR)

$$\text{TOR} = \frac{\text{No. of Admission}}{\text{No. of Beds}} \times 100$$

The turnover rate essentially defines the period for which a bed is occupied. It indicates the speed with which patients on any bed are rotated. The more complicated the case dealt by the hospitals, the smaller the turnover rate. Larger a turnover rate, indicates an over utilization, moreover only simple type of treatments are provided. Too small a turnover rate would indicate fewer people utilizing the hospital and patients are being unnecessarily retained on the premises. Both are not desirable. However in the case of hospitals dealing with chronic diseases, a low turnover rate is a must.

Table 6.1: *Distribution of TOR on the basis of type of hospitals*

Region	**General**	**Multi**	**Aggregate TOR**
North	30.02 (19.40)	44.12 (39.76)	39.97 (35.31)
Central	49.72 (47.05)	76.50 (57.27)	67.53 (54.63)
South	67.06 (59.16)	61.98 (39.97)	61.27 (41.62)
TOTAL	48.93 (46.12)	58.29 (44.99)	55.17 (45.33)

*Figures in brackets are the standard deviation.

Above Table 6.1 analyses the Turnover Rate of hospitals in respect to the number of admissions and the bed capacity. In general, the aggregate turnover in the state as a whole is 55.17%. i.e. only slightly more than half of the capacity is being used in Modern Science hospitals of Kerala. The underutilization of capacity does effect the cost in hospital management and price of treatment to patients. Looking at the region wise the utilization, which is maximum in the central region (67.55%) followed by

southern region (61.27%) and lowest in the northern region (39.91%).An analysis on the basis of type of hospital alongside regional wise determination can also be viewed from the table. It is clearly visible that, on the basis of type of hospital, general hospitals have a TOR of 48.93 per cent as compared to the multi-specialty hospitals with a TOR of 58.29 per cent. A regional wise comparison better explains that in case of multi-specialty hospitals, Central egion has a higher TOR of 76.50 per cent as compared to North and South region with a TOR of 44.12 per cent and 61.98 per cent, respectively. TOR exhibits how well utilization has been disposed in a hospital.

In order to test the mean difference in the capacity utilization based on regions and hospital type two-way ANOVA is carried out and the result is presented in **Table 6.2**, as shown below:

Table 6.2: *Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	20026.013[a]	5	4005.203	2.066	.078
Intercept	235277.082	1	235277.082	121.347	.000
TYPE	**2375.397**	**1**	**2375.397**	**1.225**	**.272**
REGION	**12329.133**	**2**	**6164.567**	**3.179**	**.047**
TYPE * REGION	**4431.289**	**2**	**2215.644**	**1.143**	**.324**
Error	162865.794	84	1938.879		
Total	456826.802	90			
Corrected Total	182891.807	89			

The table explains the interaction between type of hospital and the region wise distribution of the hospitals show significant difference with p value less than 0.05. While the mean scores of the regional classification does not prove significant, as the p value is more than 0.05. In case of type wise hospital classification, there is significant difference between the hospitals as the p value shows a less than 0.05, at 5% level of significance.

The two-way ANOVA conducted examined the effect of regional classification and type of hospital on bed turnover rate. There is a statistically significant interaction between the effects of type and region level on bed turnover rate, **F** (2, 84) = 1.143, **p** = .324.

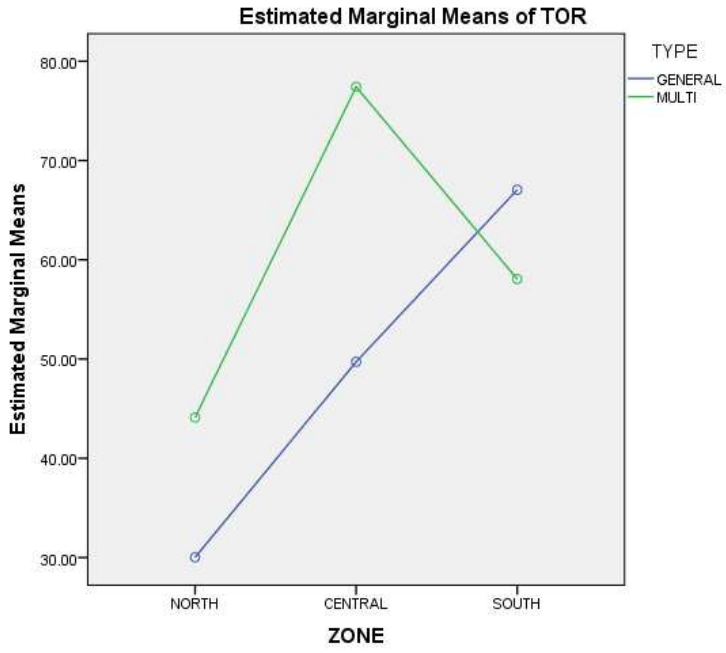

Figure 6.1: Graphical presentation of interaction between type of hospital and region wise classification on TOR.

Figure 6.1 graphically represents the interaction as analysed in the Table 6.2. The type of hospital and regional classification interaction alongside the hospital TOR is displayed.

Further in order to examine which of the regions are similar and which are dissimilar in this respect, Post Hoc analysis is carried out and the result is presented in Table 6.3.

Table 6.3: *Post Hoc Test (Tukey HSD)*

(I) Region	(J) Region	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
North	Central	-27.5546*	11.23706	**.043***	-54.3657	-.7434
	South	-21.2996	11.23706	.146	-48.1107	5.5116
Central	North	27.5546*	11.23706	**.043***	.7434	54.3657
	South	6.2550	11.76823	.856	-21.8235	34.3335
South	North	21.2996	11.23706	.146	-5.5116	48.1107
	Central	-6.2550	11.76823	.856	-34.3335	21.8235

* The mean difference is significant at 0.05 level.

Table 6.3 Post Hoc comparisons evaluate pairwise differences among the group means using Tukey HSD test since equal variances were tenable. Tests revealed significant pairwise differences between the mean score of TOR in the North and Central region as the p value in both cases is less than 0.05. Moreover, the comparison between the TOR of North and South region is not significantly different as the p value establishes a value more than 0.05, at 5% significance.

6.1.2. Outpatient / Inpatient Ratio

OP/IP ration is another good indicator of hospital performance employed by the scholar in this study. It is calculated by using the following formula.

$$\text{OP/IP} = \frac{\text{Number of Out Patients}}{\text{Number of Admissions}}$$

This ratio indicates of the manner in which Inpatients service is being utilized in the hospital. In general, the number of outpatients should be broadly related to the number of inpatients. If a hospital is reporting very high number of out -patients as opposed to inpatients then obviously the type of inpatient care in relation to the demand for medical services is poor.

On the other hand, a low outpatient/inpatient ratio would suggest that there is excessive concentration of providing inpatient care facilities and smaller ailments are not being dealt with.

Table 6.4: *Distribution of OP/IP ratio on the basis of type of hospitals*

Region	**General**	**Multi**	**Aggregate OP/IP Ratio**
North	15.46 (15.11)	6.65 (5.09)	9.24 (9.84)
Central	20.60 (18.71)	5.61 (3.83)	10.96 (13.40)
South	18.29 (23.65)	7.97 (8.47)	11.66 (16.03)
TOTAL	18.12 (18.91)	6.73 (5.90)	10.53 (13.02)

*Figures in brackets are the standard deviation.

Table 2.1 evaluates the OP/IP ratio classified on the basis of General and Multi-specialty hospitals and region wise. The concentration of Inpatient and Out Patient service determines the incapacity or overutilization of services. The above table explains an aggregate OP/IP ratio among the Modern Science hospitals in Kerala is 10.53. Among the type of hospitals, the General hospital which has a higher aggregate ratio with a mean score of 18.12 as compared to Multi-specialty hospitals with a mean score of 6.73. Region wise classification shows that the South region has a higher concentration of IP/OP ratio with a mean score of 11.66 as compared to North region with a mean score 9.24 and Central region with a mean score of 10.96.

In order to examine whether the difference in the mean ratio between the regions and between the types of hospitals in Kerala are significant , the scholar has conducted two way ANOVA and the result is presented in the Table 6.2, as shown:

Table 6.5: *Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2775.180[a]	5	555.036	3.789	.004
Intercept	12281.128	1	12281.128	83.842	.000
TYPE	**2571.739**	**1**	**2571.739**	**17.557**	**.000**
REGION	**77.645**	**2**	**38.822**	**.265**	**.768**
TYPE * REGION	**137.618**	**2**	**68.809**	**.470**	**.627**
Error	12304.268	84	146.479		
Total	25051.504	90			
Corrected Total	15079.449	89			

The table explores the interaction between type of hospital and the regional wise distribution of the hospitals, which does not show significant difference, with p value more than 0.05. In case of type wise hospital classification, there is significant difference between the hospitals as the p value shows a less than 0.05, at 5% level of significance.

The two-way ANOVA conducted examine the effect of region wise classification and type of hospital towards OP/IP. There is no statistically significant interaction between the effects of type and region level on OP/IP ratio, **F** (2, 84) = 0.470, **p** = .627.

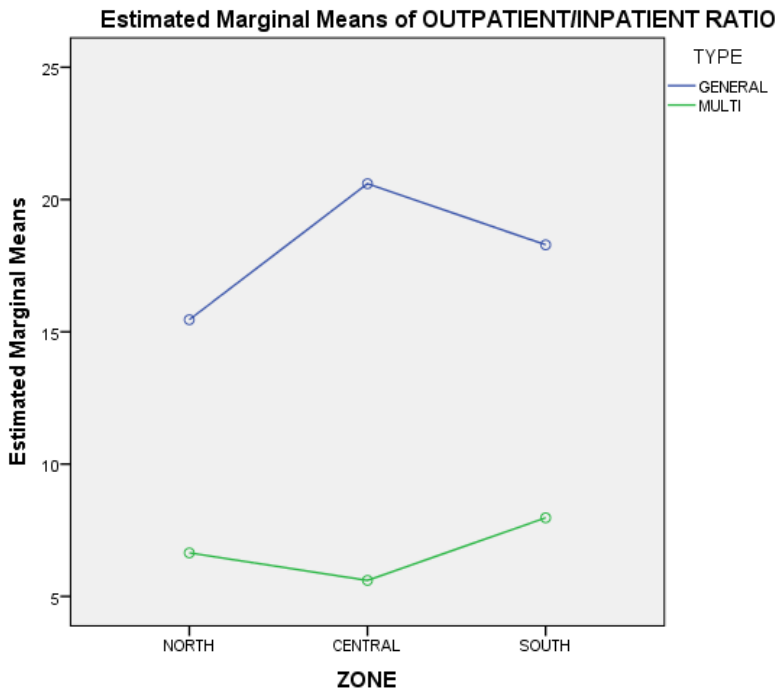

Figure 6.2: Graphical presentation of interaction between type of hospital and region wise classification on OP/IP ratio.

Figure 6.2 is a graphically representation of the interaction analysed in the Table 6.5. The type of hospital and region wise classification interaction alongside the hospital TOR is displayed, which clearly depicts that there is no interaction between the two on OP/IP ratio.

6.1.3. Number of surgeries

The provision and utilization of surgical operation facilities is also a good indicator of the functioning of the hospital.

Table 6.6: *Distribution of the number of surgeries on the basis of type of hospitals and region wise classification*

Region	General	Multi	Aggregate Score
North	6.20 (10.20)	17.92 (27.29)	14.47 (24.01)
Central	5.80 (6.02)	64.56 (71.06)	43.57 (63.35)
South	11.20 (8.81)	88.00 (125.13)	60.57 (106.25)
TOTAL	7.73 (8.59)	52.93 (84.69)	37.87 (72.37)

*Figures in the brackets are standard deviation
**Significant at 5% level.

Table 6.6 shows the average number of surgeries undertaken by different hospitals per day classified on the basis of type of hospitals.

It is clear that the aggregate number of surgeries undertaken by Modern Science hospitals in a day is 38 surgeries, in respect of type of hospitals it shows that an average of 8 surgeries are undertaken by the General hospitals and 53 surgeries by the Multi-specialty hospitals in a day. Moreover, in case of Multi-specialty hospitals, a better concentration in the number of surgeries is in the South region with an average daily surgeries of 88, as compared to Central region with 65 and 18 surgeries in North region.

Table 6.7: *Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	95035.322[a]	5	19007.064	4.302	.002
Intercept	82841.808	1	82841.808	18.752	.000
TYPE	**47902.323**	**1**	**47902.323**	**10.843**	**.001**
REGION	**19442.866**	**2**	**9721.433**	**2.201**	**.117**
TYPE * REGION	**15368.418**	**2**	**7684.209**	**1.739**	**.182**
Error	371085.078	84	4417.679		
Total	595170.000	90			
Corrected Total	466120.400	89			

Table 6.7 pinpoints the interaction between type of hospital and the regional wise distribution of the hospitals does not show significant difference, with p value more than 0.05. While, in case of type wise hospital classification, there is significant difference between the hospitals as the p value shows a less than 0.05, at 5% level of significance.

The two-way ANOVA conducted examine the effect of region wise classification and type of hospital towards the number of surgeries. There is no statistically significant interaction between the effects of type and region classification on the number of surgeries, **F** (2, 84) = 1.739, **p** = .182.

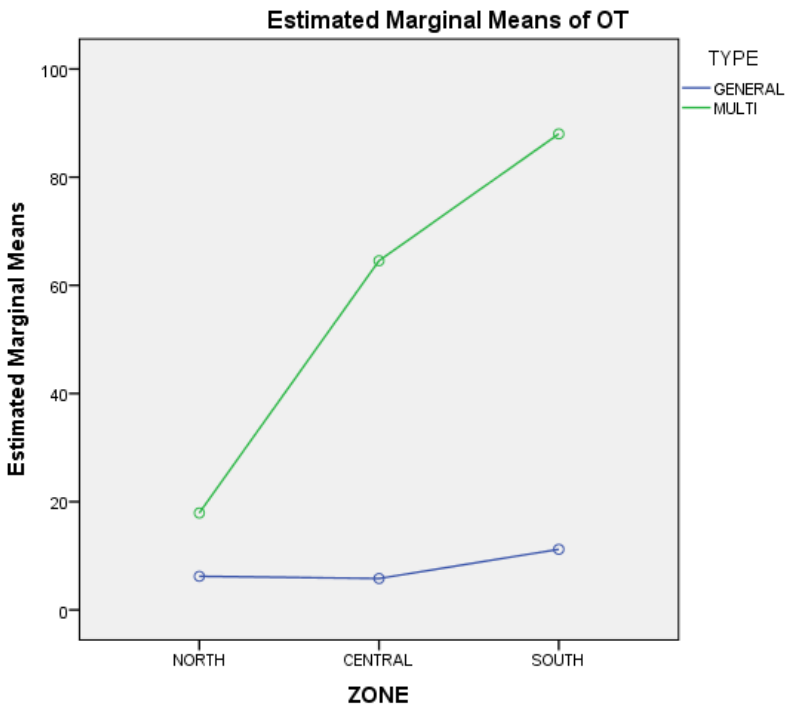

Figure 6.3: Graphical presentation of interaction between type of hospital and region wise classification on the number of surgeries undertaken in a day.

Above graphical representation is the interaction analysed in the Table 6.7. The type of hospital and region wise classification interaction alongside the number of surgeries is displayed, which clearly depicts that there is no interaction between the two on the number of surgeries.

6.1.4. Number of X-rays

The utilization of X-rays and scanning machines provides a good indicator of how the hospital is functioning. In the past, due to lack of films and other basic equipment this equipment was lying idle. A very low utilization indicates a diversion of patients away from the hospitals to other hospitals or diagnostic service centres.

Table 6.8: *Distribution of the daily average number of X-rays taken on the basis of type of hospitals and regional classification*

Region	General	Multi	Aggregate Score
North	13.30 (6.62)	106.83 (247.54)	79.32 (211.17)
Central	28.50 (30.81)	281.46 (533.33)	181.32 (466.96)
South	23.40 (10.22)	176.08 (265.06)	89.18 (134.95)
AGGREGATE	21.73 (19.54)	160.32 (359.86)	114.12 (300.48)

*Figures in the brackets are standard deviation
**Significant at 5% level.

Table 6.8 describes the daily average number of X-rays undertaken by the Modern Science hospitals in Kerala. The aggregate mean score is 114 X-rays.

On the basis of type wise classification, General hospitals undertake an average of 22 X-rays in a day as compared to Multi-specialty hospitals which undertake 160 X-rays in a day. Moreover,

in case of Central region Multi-specialty hospitals undertake 282 X-rays as compared to General hospitals which carry 29 X-rays a day.

Table 6.9: *Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	677384.600[a]	5	135476.920	1.547	.184
Intercept	702487.952	1	702487.952	8.019	.006
TYPE	**415191.952**	**1**	**415191.952**	**4.740**	**.032**
REGION	**115355.383**	**2**	**57677.691**	**.658**	**.520**
TYPE * REGION	**85588.749**	**2**	**42794.375**	**.489**	**.615**
Error	7358291.056	84	87598.703		
Total	9207825.000	90			
Corrected Total	8035675.656	89			

The Table 6.7 examines that in case of the number of X-rays, the interaction between type of hospital and the regional wise distribution of the hospitals does not show significant difference, with p value more than 0.05. While, in case of type wise hospital classification, there is significant difference between the hospitals as the p value shows a less than 0.05, at 5% level of significance.

The two-way ANOVA conducted examine the effect of region wise classification and type of hospital towards the number

of X-rays taken. There is no statistically significant interaction between the effects of type and region classification on the number of X-rays, **F** (2, 84) = 0.489, **p** = .615.

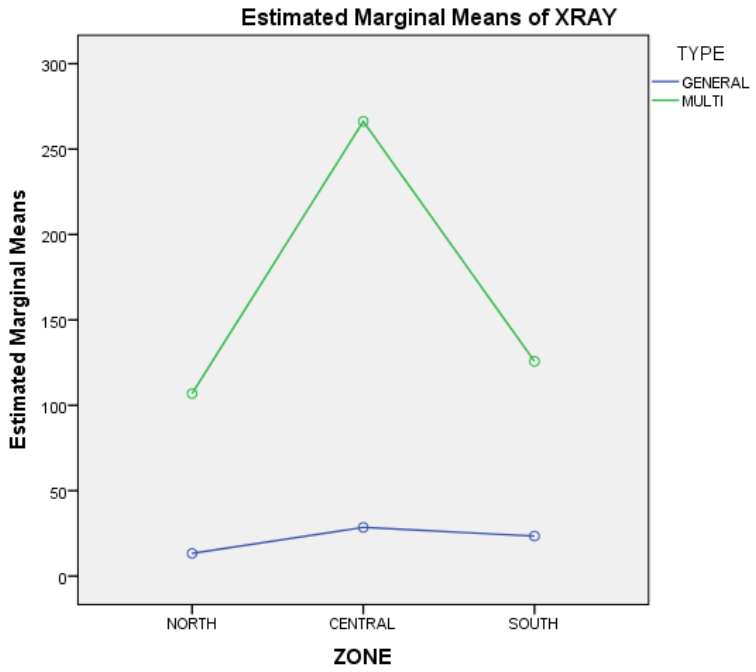

Figure 6.4: Graphical presentation of interaction between type of hospital and region wise classification on the number of X-rays.

Figure 6.4 represents the interaction analysed in the Table 6.9. The type of hospital and region wise classification interaction alongside the number of X-rays undertaken is displayed, which clearly depicts that there is no interaction between the two on the number of X-rays.

6.1.5. No. of lab tests

This indicates the availability & efficiency of diagnostic facilities in a hospital.

Table 6.10: *Distribution of the dayly average number of lab tests taken on the basis of type of hospitals and the regional classification*

Region	General	Multi	Aggregate No. of Tests
NORTH	200.00 (127.11)	755.00 (705.68)	591.76 (646.04)
CENTRAL	360.50 (190.97)	1385.42 (968.36)	1035.89 (909.04)
SOUTH	366.00 (268.83)	1538.75 (1003.69)	1169.29 (854.89)
TOTAL	308.83 (211.88)	1210.00 (914.97)	909.61 (784.30)

*Figures in the brackets are standard deviation
**Significant at 5% level.

Table 6.10 indicates the daily average number of lab tests undertaken by the hospitals classified under type. It can be better understood that the aggregate score of lab tests undertaken by the Modern Science hospitals in Kerala is 910 lab tests per day. In case of type wise classification, the number of lab tests carried out in the Multi-specialty hospitals is 1210 tests as compared to General hospitals with 309 lab tests in a day. It can also be noted that Multi-specialty hospitals of Central region undertake an average of 1385 tests in a day as compared to General hospitals were an average of 361 tests are carried out in a day.

The researcher highlights that this variation may be due the high end technologies being utilized in Multi-specialty hospitals as compared to the General hospitals. The mean difference is tested with two way ANOVA and the result is presented in table 6.11 below:

Table 6.11: *Tests of Between-Subjects Effects*

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	30315333.523[a]	5	6063066.705	6.853	.000
Intercept	46617479.428	1	46617479.428	52.688	.000
TYPE	**17100347.308**	**1**	**17100347.308**	**19.327**	**.000**
REGION	**6378663.336**	**2**	**3189331.668**	**3.605**	**.031**
TYPE * REGION	**2877327.550**	**2**	**1438663.775**	**1.626**	**.203**
Error	74322177.866	84	884787.832		
Total	179102825.000	90			
Corrected Total	104637511.389	89			

The Table 6.11 explains the interaction between type of hospital and the region wise distribution of the hospitals does not show significant difference, with p value more than 0.05. While, in case of regional classification, there is significant difference between the hospitals as the p value shows a less than 0.05, at 5% level of significance. Similarly, type of hospital also points out that there is a significant difference with the p value less than 0.05.

The two-way ANOVA conducted examine the effect of regional classification and type of hospital towards the number of lab tests taken. There is no statistically significant interaction between the effects of type and region classification on the number of X-rays, **F** (2, 84) = 1.626, **p** = .203.

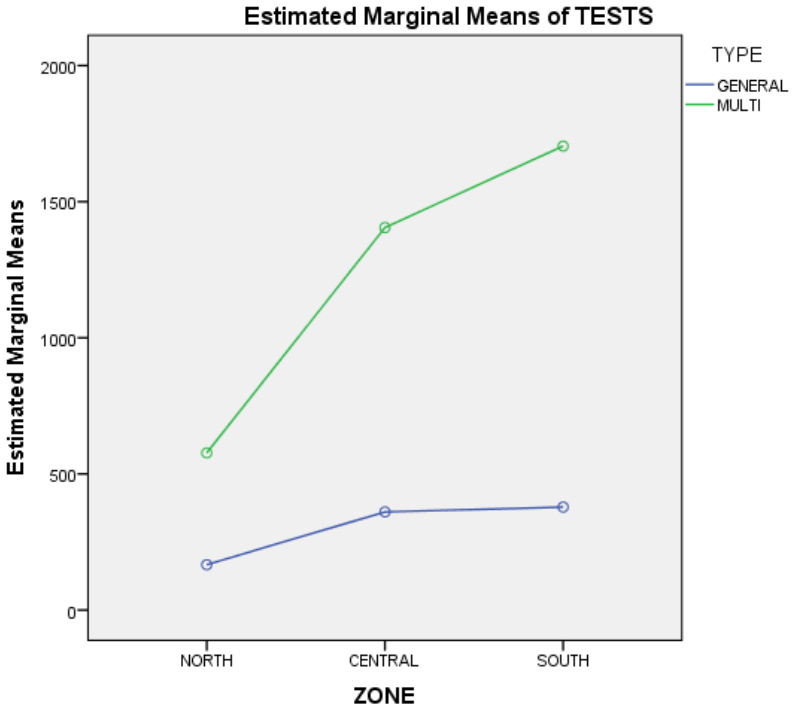

Figure 6.4: Graphical presentation of interaction between type of hospital and region wise classification on the number of lab tests.

Figure 6.5 indicates the interaction analysed in the Table 6.9. The type of hospital and regional classification interaction alongside the number of lab tests taken is displayed, which clearly

depicts that there is no interaction between the two on the number of lab tests.

Further analysis to explain the variation between the regional classification interact on lab test is analysed using Post Hoc analysis in Table 6.12.

Table 6.12: *Post Hoc Test (Tukey HSD)*

(I) Region	(J) Region	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
North	Central	-602.83*	242.870	.040*	-1182.31	-23.36
	South	-764.00*	242.870	.006*	-1343.48	-184.52
Central	North	602.83*	242.870	.040*	23.36	1182.31
	South	-161.17	242.870	.785	-740.64	418.31
South	North	764.00*	242.870	.006*	184.52	1343.48
	Central	161.17	242.870	.785	-418.31	740.64

Further to examine which regions are similar and which regions are dissimilar in respect of laboratory use, Post Hoc test is carried out and the result is presented in table 6.12.Post Hoc comparisons evaluates pairwise differences among the group means using Tukey HSD test since equal variances were tenable. Tests revealed significant pairwise differences between the mean score of lab test in the North and Central region as the p value in both cases is less than 0.05. Moreover, the comparison between the

lab tests of North and South region is significantly different as the p value establishes a less than 0.05, at 5 % level of significance.

6.2 EMPIRICAL RELATIONSHIP BETWEEN COST MANAGEMENT PRACTICES AND PERFORMANCE INDICATORS

The representation of cost management practices incorporated many items reflecting cost management including cost planning, cost control and cost reduction. With such a wide range of elements, there is linear possibility of cost management practices alongside hospital performance indicators. One of the main objective of this study is to analyze the relationship between cost management practices and performance indicators. For this, correlation analysis is used to find out the strength and functional structure is investigated. Moreover, multiple regression analysis is performed to identify whether empirical relationship exists between cost management practices and hospital performance indicators. As an interdependence technique, regression analysis is used to predict the relationship between one dependent variable and two or more independent variables. The association is evaluated through this predictive analysis.

For the study, the researcher has equated all the four indicators of hospital performance to 100 per cent. Apparently, the cost management practices i.e. cost planning, cost control and

reduction factors have been summed up to 100 per cent for the analysis.

Table 6.13: *Correlation analysis between cost management practices and hospital performance*

		Performance	Cost Management
Perf	Pearson Correlation	1	.846**
	Sig. (2-tailed)		.000
	N	90	90
Cost Mgt	Pearson Correlation	.846**	1
	Sig. (2-tailed)	.000	
	N	90	90

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson correlation revealed that cost management is significantly and positively correlated with hospital performance ($r = .846$, $p<.01$) as shown in Table 6.13. In other words, when there is an increase in cost management practices followed by the hospitals, an improved hospital performance is indicated. Hence, the study finds that there is a relationship between cost management practiced and hospital performance.

Linear regression is a statistical test applied to a data set to define and quantify the relation between the considered variables. Univariate statistical tests such as Chi-square, Fisher's exact test, *t*-test, and analysis of variance (ANOVA) do not allow taking into account the effect of other covariates/confounders during analyses. However, partial correlation and regression are the tests that allow

the researcher to control the effect of confounders in the understanding of the relation between two variables.

The researcher has further analysed the data using regression analysis, the result of which is presented in table 6.14 below.

Table 6.14: *Multiple Regression Model Summary*

Model	Sum of squares	df	Mean square	F	Sig.
Regression	1542381.16	3	15425381.16	200.052	0.05
Residual	6785401.47	86	77106.84	R	R square
Total	22210782.64	89		.846	0.694

Dependent Variable: Performance
Predictors: Planning, Control and Reduction.

In the model summary, R shows the correlation which basically points put the linear relationship between two variables (cost management practices and hospital performance).

R square is 0.694, which implies that there is a variation of 69.4% between cost management practices (independent variable) and hospital performance (dependent variable). This simply means that, cost planning, cost control and cost reduction jointly contribute and reflect the hospital performance at 69.4%.

Hence it can be concluded that better cost management practices in modern science hospitals in Kerala will definitely improve the hospital performance.

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Chapter VII

SUMMARY, FINDINGS, CONCLUSION & SUGGESTIONS

7.1 Introduction

Adhering to the competition, healthcare costing has been a significant initiation in restructuring the management of healthcare sector. Management of operation is not mere the evaluation of cost but also control and its reduction to place the efficiency and effectiveness in outcome. A wider scope to cost management can be traced in this sector due to uncompromising intensity of competition which has initially forced the hospital management to rethink about their cost apprehension. Recalculation of price through techniques of cost control and cost reduction has brought one step forward in visualizing the scheme for better management.

Value maximization has indeed stood as an upper hand in revitalizing this unique concept of advanced cost management. The increase in availability of substitutes and their awareness in healthcare facilities have brought forward price sensitiveness which urges the need for being cost conscious by the hospital management.

The thrust to evaluate cost, enhance cost control and reduction techniques have turned out to be the need of the hour.

7.1.1 Cost Management

The management of cost is terminal in the journey of quality and destination of efficiency. Benefit received for sacrifices made, the motto of costing need surveillance to protect consumer rights. Effectiveness and efficiency have explored the necessity of cost conformance. Cost pressures on healthcare sector and measures to overcome them, balancing cost and quality. Transparency of cost is unique with greater risk. Settlement of risk is an established challenge due the critical aspects of life being ailed. Healthcare covers not only medical care but also preventive care. Healthcare service can be widely listed as:

- Medical Department
- Medical Support Service Departments
- Non-Medical Support Service Departments

The need for cost accounting penetrates as a tool in the following manner:

- Measuring performance
- Reducing cost
- Determining the fees or prices for goods and the services
- Decision Making
- Deciding to authorize, modify or discontinue a program or activity
- Inventory management

7.1.2 Significance of the Study

Cost is not the responsibility of one department, rather skillful integration of management processing and finance. A form of Management accounting that allows a business to predict pending expenditures to help reduce the chance of going over budget. It also helps a company to determine whether they accurately estimated expenses at first, will help them predict expenses in the future. In simple terms, recording, classifying, allocation and appropriation of expenses for the determination of cost of products or services and for the presentation of suitably arranged data for the purpose of control and guidance of management.

Today, a surgical approach to profitability and cost management has been visualized. That is, by understanding which products, services, consumers and channels are truly profitable and which ones are draining value from the business. A protective shield to value consumer have exploded the scope of cost management.

7.1.3 Statement of the Problem

Healthcare- a competition led economy has purely justified the competency of service charges in fluctuating the demand through the intense competition in the market. Advancement in technology and technical innovativeness have rebuild the phase of healthcare and hospitals are appreciated by its stakeholders on the

restructuring of the market demand on these frictions rather than the impact of core services. The origin of this study lays on the impact of intensity in competition which ultimately leads to strategic cost management.

7.1.4 Research Questions

Based on the various aspects of healthcare sector discussed in the above section, following research questions were formulated:

1. Are patients' price sensitive towards availing services from Modern Science hospitals?
2. What is the prevailing cost structure among the different classes of hospitals?
3. Has there been any cost management practiced by the hospitals?
4. Are the hospitals aware about the scientific allocation of overhead cost to each consumer?
5. Does the hospital performance indicators improve when there is better cost management and cost structure followed by the hospital?
6. Is there any variation in the study variable based on hospital profile?

7.1.5 Objectives

1. To examine the patients' price sensitivity towards Modern Science Hospitals services in Kerala and its variation based on sample profile.
2. To analyze the prevailing cost structure of hospital services and its variations.
3. To study the prevailing cost management practices followed by hospitals in Kerala and its variations.
4. To examine the awareness, interest and implementation of ABC in hospitals of Kerala and its variations.
5. To study the empirical relationship between cost management practices and the performance indicators of the hospital.

7.1.6 Hypotheses

On the basis of above said objectives, following hypotheses have been formulated and tested.

Hypothesis 1

Patients' price sensitivity towards Modern Science hospital services in Kerala is independent of profile variables.

Hypothesis 2

The cost structure of hospital services of Kerala is independent of profile variables.

Hypothesis 3

The cost management practices of hospitals are independent of profile variables.

Hypothesis 4

The awareness, interest and implementation of ABC in hospitals of Kerala are independent of profile variables.

Hypothesis 5

The performance indicators of the hospital are independent with regard to the cost management practices.

7.1.7 Conceptual model

The review of literature broadens the areas various concepts for this study. Major concepts like cost structure, cost management involving cost control and reduction, activity based costing and performance indicators are briefly elaborated mapping the various corners of the study. Chapter three gives a better understanding of the conceptual framework in detail.

7.1.8 Research Methodology

The methodology used of the study is based on theoretical concept of “research onion”, proposed by Saunders et al. (2016).A detailed description of the research phenomenon is layered through this concept. This approach elaborates the research philosophy i.e.

concerning the nature of the reality being investigated, approaches involving deductive approach, methods and strategies utilized for the study briefing the survey method alongside the methodological choices where the researcher has used mono quantitative method for the study and the time horizon framed for the study, being cross sectional study.

The research methodology altogether takes the research logic to the research design involving main techniques and procedures of data collection and analysis.

7.1.8.1 Sample design

Stratified random sampling was drawn by the researcher for the study. The entire state of Kerala is segmented as three regions namely; North, Central and South for the study.

7.1.8.2 Selection of Hospital

30 hospitals were randomly selected from each of the district selected from the regions. The aggregate sample of Modern Science hospitals for the study is 90 hospital, with 2:1 ratio between Multi –specialty hospitals and General hospitals.

7.1.8.3 Selection of Patients

For analyzing first objective of the study, data from the patients were collected. Using systematic random sampling, five patients from each of the above 90 hospitals were selected, totaling 450 patients.

7.1.8.4 Research Instrument and Method of Contact

The research instrument used for the study is Interview Schedules for collecting data from both cases i.e. hospitals and patients. The two types of data were collected using two types of pretested interview schedule covering all the aspects of the study. The instrument have been validated using Cronbach's alpha.

7.1.8.5 Variable Used for the Study

The study variables include price sensitivity analysed through detailed price analysis for choosing the hospital service, whether they are charged more for the hospital service, the rating for price sensitivity and price comparison. Similarly for the study variable Activity Based Costing, its awareness, interest, implementation and activity analysis were mentioned. A detailed explanation for the aforesaid variables is in chapter one of the thesis.

7.1.8.6 Scaling Technique

For analyzing the data from the sample of hospitals, 7 point Likert Scale has been used in view of the informants' knowledge and for examining patients' data five point Likert Scale is used.

7.1.8.7 Tools for data analysis

The data gathered from the sample of hospitals of private sector were analyzed using descriptive and inferential statistics by employing the statistical Packages for Social Sciences (SPSS) 20. Independent sample t test, analysis of variance (ANOVA), Post

Hoc analysis, correlation analysis and regression analysis were used for testing the hypotheses of the study.

7.1.9 Limitations

Overall the study is not free from limitations. It was found that not many hospitals were practicing scientific method of managing cost, which initialized a tedious process to share information.

1. Most of that data were qualitative in nature, which had to be quantified for the purpose of the study. Limitations of the scaling technique apply for this study also.

2. Lack of support to share the information, in purview of confidentiality.

3. Recall errors form part of the data as the method of interaction bounded memory recollection.

Above said are the few limitations which is discussed in detailed in chapter one of the study. However sincere efforts have been made to reduce the errors.

7.1.10 Structure of the Thesis

On the basis of the objective of the study, the structure of the thesis is developed. The first chapter is the introductory part, with an overview of the Indian healthcare sector and also in concern to the Kerala model of healthcare further discussing the

objectives of the study and research methodology. The second chapter is the background of the study insisting on the research gap. The conceptual framework of the study and theories involved in the study has been discussed in the third chapter. The fourth chapter is the expansion of the first and second objective of the study i.e. price sensitivity and cost structure of the hospital. Regarding the cost management practices and the awareness level of ABC has been very well elaborated in the fifth chapter. The last two objectives of the study, explaining the performance indicators and empirical relationship of cost management and hospital performance indicators have been analysed in the sixth chapter. The last chapter concludes with the summary, findings, conclusion and suggestions of the study.

7.2 Review of the Literature

The background of the study has been discussed in detail in the second chapter of the study. It has been categorized on the concepts genesis of cost management, reflections of Activity Based Costing and the new state of the art. Each of these concepts elaborates the relative studies which has been highlighted through the methodology, variables used and the findings. The study has been substantiated by 100 literature reviews, focusing on the areas and theories of this study. For an overview, the entire reviews have been segregated on the basis of three aspects, i.e. genesis of cost management, reflections of Activity Based Cost and a new state-of –the –art hospital.

Cost management has been reformed on various norms and strategies mapping cost control and reduction techniques, rebuilding innovations through elimination of non-value added techniques. Reviews of the studies pinpoint the strengths that outrage through better cost management system in various industries. It signifies the role of cost management in a wide spread competition and recasting the know how in developing various workflow for management. The second half of the reviews exert on the merits and complications of using Activity Based Costing technique. To restructure the indirect cost, conventional forms does not prove meritorious, ABC technique has given a glow in identifying the indirect cost rather than the traditional way of cost smoothing. Non-value added activities are eliminated and value added activities show restructure the means for cost management. The last half of the reviews concentrate on the present scenario in the hospital industry, emphasizing on the competition, cost and the patient awareness on various health facilities. Price sensitivity of the consumers and cost conciouness also takes share in this part of the study.

Architecture of healthcare services have been very well figured out through the flow of services, the size of hospital and the cost concentration that it procures. Eventually, an overview of various inputs for the study has been captured in this chapter, highlighting the traces of ABC and cost techniques.

7.3 Theoretical Framework

The theories that consolidate the study includes the pricing concept and its approaches, role of cost, costing standards, the cost drivers, cost management including cost control and cost reduction techniques and healthcare.

Costing standards that consolidates the study are; CAS-1(classification of cost) which segregates the cost structure on the basis of nature of expenses and its traceability i.e. material, labour and overhead, CAS -6 (Material Cost) assigning of material cost including recording the resources consumed by the cost object, CAS -10 (Direct Expenses) it determines in terms of materiality of an item i.e. on the basis of size and nature, CAS -13 (Cost of Service cost centre) identifying service cost centre through the principle of materiality.

The theories that figure out the frame of the study include the material cost, labour cost and overhead forming the structure of the cost. Terminologies that thrust cost management including cost, costing and various fractions of cost management form part of this chapter. A baseline on Activity Based Costing techniques, its textures including cost drivers, activities, resource drivers very well strength this section. The techniques for cost reduction and cost control which include benchmarking, outsourcing, bulk purchase, value engineering nad value analysis have been highlighted very well in this chapter. The techniques that organizes cost

management and the mapping of cost management is also formulated in the chapter.

7.4 Discussions on Findings

The researcher throws light on various aspects of healthcare cost management, in particular to the prevailing forms accustomed in the sector. Healthcare has been inextricably linked to business.

The study has been consolidated through the aforementioned objectives in Chapter 1.The prevailing cost management practices followed by private hospitals have been visualized through the concepts framed for the study. It includes various aspects of cost control and cost reduction techniques that have been form part of the hospital. This section summarizes the findings of the study apportioned on the basis of various objectives.

7.4.1 Healthcare Price Sensitivity

Price sensitivity of the patients and cost consciousness of the hospitals have been clearly depicted in chapter four, insisting on the particulars from the patients view point and also from the institutional perspective. The factors like whether detailed price analysis are made before choosing a hospital, whether the patients feel they are charged and price comparison shared a vital part in price sensitivity analysis. Similarly, in the case of hospital cost conciouness, consumer complaints, affect due to changes in price

and the priority for patients' price sensitivity form vital part of the study. Below are the mentioned major findings of the study:

1. The aggregate patients' price sensitiveness towards Modern Science hospital services showed a mean score 4.18 out of 5 (83.6%).

2. It is also observed that the mean score for the General hospital patients' is 4.82 out of 5 as compared to the Multi-specialty hospital patients' with a mean score of 4.78 out of 5.

3. The female respondents are less price sensitive as compared to male respondents with a mean score of 4.14 (82.8%) and 4.22 (84.4%).

4. The factor like detailed price analysis shows a higher mean score among the patients' from semi - urban sector as compared to Urban sector, with a mean score of 4.72 and 4.38 respectively.

5. There is a visible price sensitivity factor wise analyzing the categories of hospitals on the basis of ownership, proved statistically using One-way ANOVA that the patients feeling charged more for the service and price comparison before attaining the service shows a significant difference at 5 % level, with a 'p value' less than 0.05.

6. The patients' in the age group 15 to 24 years shows a high mean score of 4.21(84%) as compared to patients' in the age group of 65 and above having a mean score of 3.20 (64%).

7. The aggregate cost consciousness with regard to institutional point of view Shows a mean score of 5.39 out of 7 (77%).

8. Statement wise aggregate mean score with regard to hospital type shows general hospital 5.64 and Multi – specialty hospital is 5.30 as against a maximum score of 7 indicating 80.6 per cent and 75.7 per cent cost consciousness, respectively.

9. It can be observed that the cost consciousness of the hospitals with up to 100 bed size is 5.71 followed by hospitals with a bed size 101 – 300 bed size is 5.33.The differences are also statistically significant in case of factor wise consideration among the hospitals classified under bed capacity, as the 'p value' for One-way ANOVA test is less than 0.05 at 5 % significant level.

10. The cost consciousness of the hospitals practicing cost management has a mean score of 5.35 out of 7, which is 76.4 % whereas the hospitals that are not practicing cost management has a slightly higher mean score of 5.59 out of 7, that is 79.8%.

7.4.2 Cost Structure Analysis

Hospitals prevailing cost structure is analysed in this part, which has been broadly analysed in chapter four of the thesis. Cost has been classified on the basis of CAS-1 issued by the Institute of Cost Accountants of India, 1959. nature of cost i.e. material, labour and overhead. Furthermore, as aforementioned the labour cost has been further classified as doctors' cost and other staff cost, similarly overhead cost has been classified as technology cost and quality cost. Below are the mentioned major findings of the study:

1. The study revealed that labour cost involves 49.7 per cent of the total cost incurred in the hospital, followed by an overhead cost of 28.1 per cent and material cost of 22.2 per cent.

2. In case of hospitals were cost management is practiced about 50 per cent of the total cost is labour, 27.6 per cent overhead and 22.5 per cent material whereas, the hospitals were cost management is not practiced have labour cost of 48.8 per cent, overhead cost 30.5 per cent and material cost of 20.8 per cent.

3. Quality Accredited hospitals has higher material cost of 50.3 per cent than Non – Accredited hospitals with 49.5 per cent, while overhead cost is higher in Non – Accredited hospitals with 28.5 per cent as compared to that of Quality Accredited hospitals with 26.7 per cent.

4. Labour cost has its major share for the doctors cost of 34.5per cent in the North region of Kerala, while 28.8 per cent is observed in the Central region and 32.8 per cent in the South region in the region wise classification.

5. In case of bed occupancy rate classification, 0 to 25 per cent stays highest in case of Doctors' cost with 34.2 per cent as in case of 50.01 to 75 per cent bed occupancy rate which is 27.9 per cent as the lowest.

6. General Hospitals shows Doctors cost higher with 34.5 per cent as compared to that the Multi-specialty Hospitals with 31.2 per cent. While other staff cost showed 14.9 per cent and 18.6 per cent in case of general hospital and multi-specialty hospitals, respectively.

7. Type wise classification of hospitals shows that general hospitals hold technology cost of 18.9 per cent while the multi hospitals indicate 17.3 per cent.

8. Technological cost among the hospitals categorized under years of establishment shows that under the category of 76 years to 100 years the technology cost is 20 per cent as compared to hospitals under the category of 26 years to 50 years having 17.1 per cent.

9. The hospitals practicing periodic cost evaluation show 18 per cent as technology cost whereas hospitals not practicing cost evaluation show technology cost of 17.3 per cent.

10. The differences in Quality Accredited and Non – Quality Accredited hospitals indicated quality cost of 9.8 per cent and 12.1 per cent, respectively.

A detailed analysis of the price sensitivity and the prevailing cost structure has been explained in chapter 4. The gathering of cost structure on various aspects have been analysed and scrutinized on the basis of various categories in the aforementioned chapter.

7.4.3 Cost Management Practices

This section points out the major findings of the second objective of the study, understanding the prevailing cost management practices of the hospitals. Cost management has been analysed under cost control and cost reduction techniques used. Various cost control methods used in the study include value engineering, outsourcing, responsibility centre and benchmarking. While, cost reduction methods involve value analysis, bulk purchase, alternate labour and alternate material. Below are the mentioned major findings:

1. The level of cost management practiced by the Modern Science hospitals shows an aggregate mean score of 52 per

cent while cost reduction shows a mean score of 80 per cent and cost control has a mean score of 19 per cent. It further explains that cost management is followed by cost reduction but cost control measures needs drastic

2. General hospitals has a mean score of 58 per cent as compared to Multi-specialty hospitals with a mean score of 50 per cent in case of level of cost management practiced.

3. The classification under bed size, in case of cost control, hospitals having bed size of 501 and above has the least mean score of 10 per cent as compared to that of hospitals with bed size of 101 to 300 beds having mean score of 20.8 per cent.

7.4.4 Activity Based Costing

This sector emphasis on the awareness level of costing technique, Activity Based Costing (ABC).The awareness, interest, the implementation phase and whether activity analysis is being followed by the hospital is analysed in this section. The study details about the significance of ABC as a technique for improving the overhead cost. Following are the major findings of the study:

1. The aggregate score of the awareness level of ABC technique is 2.50 out of 7 i.e. 35.71 per cent.

2. Through the classification of bed capacity the category of 301 to 500 beds have a higher mean score for aggregate

awareness level of ABC with 2.58 out of 7, 36.86 per cent as compared to the category of 501 and above beds having a mean score of 2.30 out of 7 representing 32.86 per cent being the least.

3. In case of implementation phase similar preference is noticed by the hospitals practicing periodic cost evaluation with a mean score of 1.05 and the hospitals not practicing periodic cost evaluation with a mean score of 1.06 indicating a a poor preference among the categories of hospital.

4. The region wise classification, North region has a higher aggregate awareness level of 2.98 as compared to Central and South region having a mean score of 2.55 and 1.91, respectively.

7.4.5 Key Performance Indicators

Hospital performance is indicated through various ratios bridging the different concepts of the study. These include bed turnover ratio, Outpatient-Inpatient ratio, number of surgeries, number of X-rays undertaken and number of lab tests done. These criteria analyze the level of performance of each hospital. Below are the major findings:

1. The Turnover rate classified on the basis of type of hospital showed that general hospitals have a TOR of 48.93 per cent

as compared to the multi-specialty hospitals with a TOR of 58.29 per cent.

2. The number of surgeries undertaken by different hospitals classified on the basis of region showed a better concentration in the South region with an average monthly surgeries of 88, as compared to Central region with 65 and 18 surgeries in number.

3. The monthly average number of X-rays undertaken by the hospital on the basis of General and Multi-specialty hospitals indicated that General hospitals undertake an average of 22 X-rays as compared to Multi-specialty hospitals which undertake 160 X-rays in a month.

Furthermore, the empirical relationship between cost management practice and performance is analysed using correlation and regression analysis, which proved that there exist a relationship. Thus, the study focused on various dimensions that root the cost management practices of healthcare.

Confined to the mentioned, various findings that contributes to the study are discussed and categorized according to the objectives of this research in chapter four, chapter five and chapter six. Some of the major findings of the study are as mentioned below:

1. The patients' price sensitivity showed a very high responsiveness of 84%.

2. The effect on gender wise classification interpreted that the male patients have a higher price sensitivity of 84% as compared to that of female patients with 83%.

3. An analysis under the classification of hospital bed capacity indicates that the hospitals with 50 and above beds show a lesser cost consciousness of 57% as compared to the hospitals with bed capacity up to 100 beds with 82%.

4. Hospitals classified according to the evaluation of cost management practices presented a higher price sensitivity of 80% for the unpracticed hospitals as that of practiced hospitals indicate a lower price sensitivity of 76%.

5. The aggregate cost structure interprets a higher element of labour cost of 50%, material cost 22% and overhead cost 28%.

6. Region wise classification of the hospitals show that the cost structure shows a higher labour cost of 52% as that of central one with that of 48% in south region and 49% in north region.

7. The level of cost management practiced by the Modern Science hospitals shows an aggregate mean score of 52 per

cent while cost reduction shows a mean score of 80 per cent and cost control has a mean score of 19 per cent.

8. The aggregate score of the awareness level of ABC technique is 2.50 out of 7 i.e. 35.71 per cent.

9. The Turnover rate classified on the basis of type of hospital showed that general hospitals have a TOR of 48.93 per cent as compared to the multi-specialty hospitals with a TOR of 58.29 per cent.

10. The region wise classification, North region has a higher aggregate awareness level of 2.98 as compared to Central and South region having a mean score of 2.55 and 1.91, respectively

As mentioned above, the detailed analysis and its findings are presented in the previous chapters.

7.5 Conclusion

The era of price transparency has arrived for hospitals and health systems. These days, pressure on price comes from several directions: patients, payers or market conditions. Unlike the earlier days, the absence of referral system and more of choice basket lead to a cut throat competition. To meet the economic challenges faced by the industry, and to provide low-cost high quality service, healthcare organization need to develop stringent control over their operations. The only way that the firms survive in the fierce

competitive market is to control their costs which will eventually lead to an increase in profit margin. Desire challenges of health profession is to measure actual costs in real time.

The application of lean to healthcare is widely debated and in concern an effect of the patient's perception and the ability to standardize physician and nurses without sacrificing the quality of patient care. Costs are likely influenced by the desired accuracy, timeliness and level of aggregation, when increased accuracy, timeliness and detail are desired, the preparation costs are higher. Accurate cost information provides a competitive advantage. Moreover, value based care has been in demand flourishing the acceptance of advanced technology and facilities. Low value added activity consumes time, resources or space but adds little in satisfying consumer needs. If eliminated, consumer value or satisfaction decreases unperceptively or remains unchanged. This brings the share of ABC in healthcare sector. Often the reasons for rejecting ABC include:

- Satisfied with current system
- High cost
- Lack of top management interest
- Not usable for hospitals

But the benefits substantiates its presence in the edge of current scenario, they include:

- Better profitability

- Better decision making
- Process improvement
- Cost estimation
- Cost of unused capacity

ABC calculates cost price by determining wage of resources, it differs from tarrif method. Moreover, high amount of indirect costs in the hospital indicates that capacity of resources are not used properly. The primary building material for ABC is knowledge of the activities and other resources employed by the organization. ABC system provides improved insight into managing supposedly fixed cost, thus providing easier allocation. One important distinction between ABC and traditional system is that, ABC system classify overhead cost precisely. The diagrametical description of ABC can be noticed from figure 7.1.

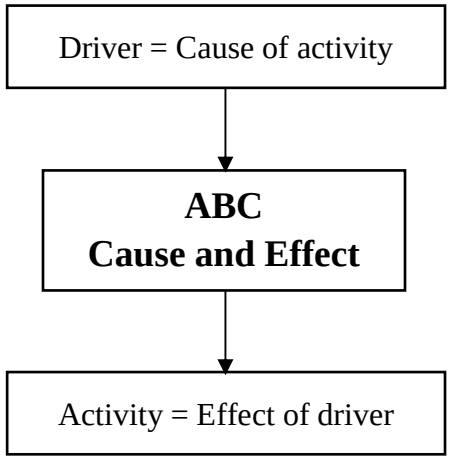

Figure 7.1: Mapping of ABC

Healthcare management is subject to long term trends and current themes. Over the years the introduction of zero –base budgeting, reengineering, TQM, ABC, CQI, total cost management and so on are all the critical elements or the long term theme of improving quality while containing costs. The newest theme to this long term trend is that of value – added/non-value added costs. By better understanding the costs of various activities, managers can improve the efficiency of various hospital departments as well as hospital systems as a whole. Through ABC both variable and overhead cost is tagged back to each consumer. ABC however, implicitly takes a longer term view by recognizing that, overtime, these indirect costs can be charged and hence are relevant to management choices. By shifting an allocation base to an activity that is related to output or output characteristic, the link between the use of resources and service output becomes more accurate.

Volume matters in hospital, to the hyperbola concept. A step beyond cost control and cost reduction is cost prevention and cost avoidance (to prevent unnecessary use of resource and unnecessary cost.)There is an almost complete lack of understanding of how much it costs to deliver patient care. Few questions that summarize this study involve the fact and significance of understanding cost management.

How many patients can we treat before we run out of money?

Where is the best position to cut costs?

What makes a cost direct or indirect and how you choose to measure it?

The healthcare field is ready for a revolution in cost management. Cost consciousness of the healthcare service providers and the price sensitivity of the patients moulds the value of cost in this sector. Technology and its advancement has lead to the heap of overhead cost and this has hit the affordability of the patients. Indirect cost thus can be dealt through analyzing how much of the accuracy of costs improves depends on how different services are in their use of the activities.

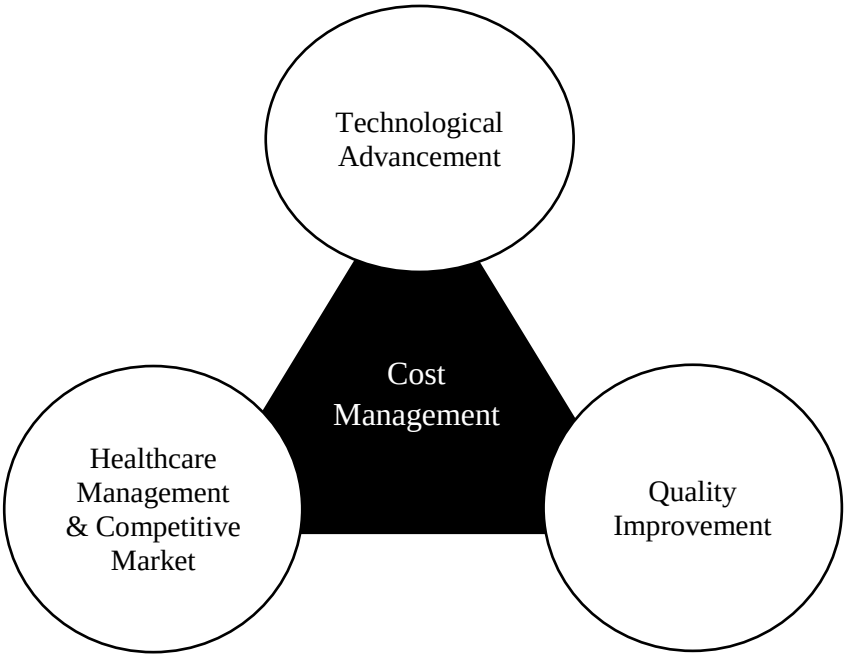

Figure 7.2: Healthcare sector

To recapitulate, competition merged the de rooting of traditional attire of the healthcare services, especially inducing the concept of facility, quality and technology as among the basics of health rejuvenation. The concept of healthcare has been transformed as disease care in this context, dwelling fierce competition to the sector. The realization of cutting the edge of competition can only be developed through cost management has only tiptoed into the sector. This scenario build the significance of this study findings and suggestions to rebuild the Kerala model of healthcare through strategic cost management.

7.6 Suggestions

The researcher has focused the study through the themes mentioned in Chapter 1. Cost management has been elaborated through the concepts explained in chapter, discussing the framework of the study. The limitations of the study thresholds the following suggestions:

7.6.1 Cost Management

1. Life cycle costing can redevelop a better cost management mechanism among the hospitals.

2. Dashboards are performance driven reporting mechanisms. They provide at – a glance summary of an organizations performance of key matrices. William Cleverley has created

a financial dashboard system for the hospital industry. He recommends ten key performance drivers, as follows:

- Market factors
- Pricing
- Labour Costs
- Supply Costs
- Cost Position
- Non – Operating Income
- Service Intensity
- Investment Efficiency
- Plant Obsolescence
- Capital Position

Each driver has a unique set of measure.

3. Balance scorecards is more strategically oriented. The balance score card retains financial measures of the drivers of future performance. It is composed of four perspectives or quadrants that together form its basic framework. The original Kaplan BSC's quadrants included financial, internal business process, consumer and learning and growth. Dr.George Pink led a Canadian team in developing a BSC especially for hospital systems. This extensive project developed a comprehensive system wide report on hospital performance t adapted from the balance – score card framework, as shown in figure 7.3.

Financial Performance & Condition	Clinical Utilization & Outcomes
Patient Satisfaction	System Integration & Change

Figure 7.3: Balance scorecard

4. Capacity driven ABC approach this emphasis on capacity. In healthcare capacity is most applicable during start-up. Overall potential capacity is recognized as total resources and is divided into overall time unit capacity.

5. Activity Based Management and Time driven ABC should be the emphasis of this sector.

7.6.2 Labour

1. Human Resource Management should form part of the sector.

2. Doctors should be enrolled in the payroll mechanism with scales ranging according to their qualifications and expertise.

3. Bed size, average patient size of the hospital and number of doctors should be correlated.

4. Paramedical and other medical support staff should be managed alongside the bed size.

5. Technical staff should be appointed to the proportion of demand of the patient size in the hospital.

6. In case of the non-medical staff, the area (space) of the hospital, the medical departments served by the hospital and the patient folk of the hospital plays a significant role in determining the number of staff.

7. The consistency in multi-tasking of well qualified human power should be maintained in the hospital for better cost efficiency.

7.6.3 Material

Cost for medicines and consumables play a dynamic task in building the cost structure of the hospital.

1. There should be brand limit or consistency in the number of brands for the medicines supplied from the hospitals. It is suggest to be within three to five brands in number.

2. The generic name for the medicines should be insisted and not focusing the brand of the medicine. The brand image for the medicines often create a huge cost for the hospital

3. The regulatory authority including drug control regulators and the above mentioned governing body should regulate the scenario of price mechanism.

4. Consumables utilized by the hospitals should be regulated by the price and quality control regulators and insist on the above pointed brand management.

7.6.4 Overhead

1. Appropriate technology should be made use of by the hospitals.

2. Patient size, place of residence and bed size of the hospital should be the criteria for installing the technology for the hospital.

3. For the cost of electricity, reengineering mechanism within the hospital should be a matter of renovation.

7.6.5 Implications

1. A governing body including members from different spheres should be developed. Rather than focusing on the providers and payers of the sector, the stakeholders should form part of the body. There should be sub divisions for payroll, technology and quality indicators.

2. The functioning of scientific cost management, a monitoring mechanism both internal and external to a hospital should be established.

3. From the government perspective, a regulatory mechanism for the private hospitals should be made, focusing on the transparency of price mechanism, the bed size permitted for the hospitals and pinpointing the service quality both medical and non-medical.

4. Justification in the technological and facility utilization should be ensured through the target market of the hospitals.

5. Hospitals should be made aware of strategic cost management, educated about the relevance of cost consciousness by the aforesaid governing body.

6. There should be a quality ranking system for the private hospitals in Kerala.

7. Clinical establishment bill to be part of the sector.

8. Referral system should be emphasized to bring a better medical outcome and to evacuate overcrowding.

9. Private primary health care should be provided with subsidies by tdhe government, as they lay the backbone of our economy.

10. Emphasis to be contributed for implementing ABC technique.

11. Health insurance should be prevail at every nook and corner of the sector and patients should be educated about the same.

12. Putting a cap on doctors' charge, affordability and cost effectiveness should play vital in the pricing mechanism.

13. Provider's profit such as radiology, laboratory, pharmacy and ambulatory surgery are the ones most vulnerable to poaching. There should an intense monitoring mechanism from the drug controls regulatory and the aforesaid governing body.

7.7 Scope for Further Research

Further research can focus studying the effect of the variables used in the study in the others sectors of the economy. Following are few areas were further research can be focused:

1. ABC of healthcare services.
2. Time driven ABC for laboratory services
3. Healthcare services cost of quality in the cooperative hospital of Kerala.
4. Cost benefit analysis of Quality accredited hospitals
5. Labour productivity – payroll mechanism for Doctors.
6. Life cycle costing of hospitals.

7. Marketing strategies of private hospitals.
8. Pharma industry- cost benefit analysis
9. Health insurance and its arena in building the affordability for the patients.
10. Cost management approaches in medical tourism sector of Kerala
11. Outsourcing of medical support services – cost control mechanism
12. Value Engineering – a control mechanism of healthcare services.
13. Overhead cost analysis – TDABC
14. Lean Management of hospitals.
15. Pattern of patients' switching behavior.

Above mentioned are few areas for research. Cost management provides a plethora of reseach insights, few questions that figure out are as follows:

What burdens the growth of General hospital?

Is cost a matter of pricing policy in healthcare sector?

What triggers the switchover tendency among the patients for various healthcare services?

Cost has become a matter for survival in this sector, which brings the relevance of this study and initiates much more concepts to be covered for further scope.

BIBLIOGRAPHY

Akkoyun, O. and Ankara, H.(2009). Cost of Quality Management: An empirical study from Turkish marble industry, *Scientific Research and Essay*, 4(11), 1275-1285.

Akortsu, M.A. and Abor, P.A (2011). Financing Public healthcare institutions in Ghana, *Journal of Health organization and Management*, 25 (2), 128-141.

Ali, M.D.A. (1996). *A study of health culture of Lambadas of Ambodh Tanda,* University of Hyderabad, India.

Anthony, S.D. (2014). The First Mile: A launch manual for great ideas, *Harvard Business Review*, August.

Arnaboldi, M., Lapsley, I. (2005). Activity Based Costing in healthcare: A UK Case Study, *Research in healthcare financial management*, 10(1), 61-65.

Arora, M.N. (2006). *Cost and Management Accounting*, New Delhi, Vikas Publishing House Pvt.

Atmanand, (2002). *Managerial Economics*, New Delhi, Excel Books.

Aykol, D. E., Tumel, G. and Bayhan, G.M. (2007) A comparative analysis of Activity-Based Costing and Traditional Costing,

International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering, 1(3),136-139.

Bag, A.K (2018). Indo-European encounter and features of modern science in pre – colonial and colonial India, *Indian Journal of India*, 53(4), 1- 20.

Bake, W.M. (1996) *Take another look at ABC*, International management conference, January-February, 19-23.

Baker, J. (1998). *Activity Based Costing and Activity Based Management for Health Care*. Gaithersburg MD, Aspen Publishers.

Balasubramanian, D. (2019, January 20). When did modern science emerge in India?, *THE HINDU*, p.14.

Banarjee, M. (1995). *Essentials of Modern Marketing* (3rd ed.), Oxford and IBH Publishing Co. Pvt. Ltd.

Bansal, S. (2016, October 17). Health spending: How States splurge on salaries, *THE HINDU*, p.10.

Baumgarten, A. (2008). *Arizona Health Care Market Report 2008*, St.Luke's Health Initiaitve.

Belk, R., Fischer, E. and Kozinets, R.V (2013). *Qualitative Consumer and Marketing Research*, Sage publications.

Bell, L. (2014). Patient –centered care, *Journal of Critical Care*, 23(4), 325.

Bharamanaikar, S.R and Kadadi, S.V. (2017). Effect of doctors' emotional intelligence on patient satisfaction, *Abhigyan*, 35(1).

Bhatia, R. (2013). *Cost Accounting*, New Delhi, Dreamtech Press

Bhudhiraja, K. and Kesharwani, S. (2014). Activity based cost management with ERP modules in healthcare: Opportunities for CMAs.. *The Management Accountant*, 49(8), 68-80.

Blocher, E.J., Chen, K.H., Cokins, G. and Lin, T.W. (2005). *Cost Management A Strategic Emphasis* (3rd ed.). New York, Mc Graw-Hill.

Bloucher, Stout andCokin (2010). *Cost Management – A strategic emphasis* (5th ed.), McGraw-Hill

Bohmer, R.M.J (2009). *Designing care – Aligning the nature and management of healthcare*, USA, Harvard Business Press.

Braggg, S.M. (2010). *Cost reduction analysis – tools and strategies*, John Wiley and Sons Inc.

Callender, C., Grasman, S.E (2010). Barriers and Best practices for material management in the healthcare sector, *Engineering Management Journal*, 22(4), 11-19.

Carlsen, F., Grytten, J., Kjelvik, J. and Skau, I. (2006). Better primary physician services lead to fewer hospital admissions, *Journal of Health Economics*, 19(5), 731-753.

Chakraborty, S. and Dobrzykowski, D. (2014). Examining value co-creation in healthcare purchasing: A supply chain view, *Business theory and practice*, 15(2), 179-190.

Chattopadhyay, P. (2014). Value recognition and pricing of varieties of goods and services. *The Management Accountant*, 49 (5), 27-29.

Chaudhuri, A. and Chaudhuri, R. (2011). *The thorns to competition*, New Delhi, Vikas Publishing House Pvt. Ltd.

Cleary, P.D. and McNeil, B.J. (1988). Patient satisfaction as an indicator of quality care, *Inquiry*, 25(1), 25-36.

Cokins, G. (2004). *Activity Based Costing Making It Work* (2nd ed.). New Delhi, Tata McGraw-Hill.

Collina, B.M. and Fabozzi, F.J(1991). A methodology for measuring transaction costs, *Financial Analysts Journal*, 47(2), 27-44.

Constand, M.K., Joy, C.M., Bello, V.D and Law, M. (2014). Scoping of review of patient-centered care approaches in healthcare, *BMC Health Services Research*, 14, 271.

Cooper, M.H. (1966). *Prices and profits in the pharmaceutical industry*, Pergamon Press.

Cooper, R. and Kaplan, R.S. (1992). Activity-Based Systems: Measuring the costs of resource usage, *Accounting Horizons*, September.

Dafny, L.S. and Lee, T.H.(2016). *Healthcare needs real compensation and every stakeholder has a role*, South Asia, Harvard Business Review Press.

Dawes, J. (2009). The effect of service price increases on consumer retention: The moderating role of consumer tenure and relationship breadth. *Journal of Service Research*, 11, 232 – 241, DOI: 10.1177/1094670508328986

Dean, Joel (1951). *Managerial Economics*, New Delhi, Prentice Hall of India.

Dey, D. (2016). Achieving business excellence, *The Management Accountant*, 51 (7), 16-22.

Dey,D. (2014). Cost competitiveness and pricing strategies. *The Management Accountant*, 49 (5), 46-54.

Dib, H.H., Hong, S., Bin, Z. and Liang, S.H (2007). Healthcare costs in China: A need for intervention, *Journal of Health Management*, 9(1), 14-36.

Doonan, M. and Katz, G. (2015). *Choice in the American healthcare system: Changing dynamics under the Affordable Care Act*, Current, Sociology Monograph, 63(5), 746-762.

Drury, C. (2014). *Management and cost accounting* (7th ed.), Cengage Lrng Business Press.

Dutta, M. (2011). *Cost Accounting Principles and practices*, Pearson India.

Elbel, B. and Schlesinger, M. (2009). Responsive Consumerism: Empowerment in Markets for Health Plans, *The Milibank Quarterly*, 87 (3), 633-682.

Epstein, R.M. and Street, R.L.(2011). The values and value of patient – centered care, *Annals of Family Medicine*, 9(2), 100-103.

Evacus, J.R., Berman, B. (2008). *Marketing Management*, Cengage Learning.

FICCI (2018). *Demystifying Healthcare Costs: A Scientific Approach*, New Delhi: Healthcare at Cross Roads.

Finkler, A.S., Ward, D.M, and Bakes, J.J.(2007). *Essentials of cost accounting for health organization* (3rd ed.), Manachutus, Jones and Barlett Publications.

Forbes, C.D., Marflane, J.D.(1976). Cost management of patients with hemophilia felicity carter, *The British Medical Journal*, 2(6033), 465-467.

Freeman, R.E. and Auster, E.R. (2015). *Bridging the values gap*, California, Berett-Koehler Publisher, Inc.

Ganesh, R.R. (2016). Cost Competitiveness – An innovative strategic approach to boost up market share. *The Management Accountant*, 51 (9), 34-36.

Ganti, R.K (2016). Cost Optimization – Shared Service Center. *The Management Accountant*, 51 (9), 37-40.

Garimella, S. (2015). Cost Leadership and global competitiveness in the context of millennial challenges. *The Management Accountant*, 50 (2), 48-51.

Gosh,S. (2019, January 24). Moving away from 1%, *THE HINDU*, p.8.

Green, D. Granco, D.J., Cohen, A. and Webb, C. (2013). Trauma-focused treatment in a state system of care: is it worth the cost?, *Administration Policy Mental Health*, 41, 317-232.

Greer, H.C. (1952). Cost factors in price- making, *Harvard Business Reviews*, 30(4), 33-45.

Gubb, J. and Mellen – Herbert, O. (2009). *Markets in healthcare – The theory behind the policy*, London, CIVITAS: Institute for the Study of Civil Society.

Guimarães, C.M. and Carvadho, J.C.D (2012). Outsourcing in healthcare through process modularization – A lean perspective, *International Journal of Engineering Business Management*, Sage Publications,84,1-2.

Hair,L. and Mc Daniel (2004). *Marketing*, Singapore, Thomson-South Western.

Hall, J.A., Roter, D. L and Rand, C.S. (1981). Communication of affect between patient and physician, *Journal of Health and Social Behaviour*, 22(1), 18-30.

Harrison, K.L. and Taylor, H.A. (2016). Healthcare resource allocation affecting uninsured services, Journal of Health organization and Management, 30(8), 1162-1182.

Hinge, D.R. (2016). Cost Competitiveness for sustainability. *The Management Accountant*, 51 (9), 31-33.

Horngren, C.T. and Datar, S.M. and Rajan, M.R. (2017). *Cost Accounting A Managerial Emphasis* (15th ed.). South Asia, Pearson Education.

Hospital list at Calicut (2016). *Doctor's directory – Malappuram district* (5th ed.) Kerala, Star Communications.

Hospital list at Ernakulam (2015). *Doctor's directory – Ernakulam district* (3rd ed.) Kerala, Star Communications.

Hout, T. and Michael, D. (2014). A Chinese approach to Management, *Harvard Business Review*, September.

Indounas, K. (2015). The adoption of strategic pricing by industrial service firms, *Journal of Business and Industrial Marketing*, 30(5), 521-525.

Israel, D. (2012) *Data Analysis in Business Research – A step-by-step Nonparametric Approach*, New Delhi, Sage Publications.

Iyer, S.S. (2009). *Value Engineering – A how to manual* (3rd ed.), New Delhi, New Age International (P) Limited.

Jayapalan, N. (2008). *Economic history of India*, New Delhi, Atlantic Publishers and Distributors (PT) Ltd.

Jelen, F.C. and Kenneth K.H. (1983). *Cost and Optimization Engineering* (2nd ed.), McGraw Hill Higher Education.

Jericó, C.M. and Castilho,V. (2010) Cost management: the implementation of the activity-based costing method in central sterilizing services, *Revista da Escola de Enfermagem da USP*, 44(3), 734-741.

Jha, S.M. (2014). *Hospital Management* (2nd ed.). New Delhi, Himalaya Publishing House.

Kaciuba, G. and Siegel, G.H (2009). Activity –Based Managamant in a medical practice: A case study emphaisisng the AICPA's core competencies, Issues in accounting, 24 (4), 553-577.

Kagubare, M.J, Bucagu, M.M and Basinga, P. (2005). *Evaluation de la performance des mutuelles de santé au Rawanda*, Rawanda Ministry of Heatlh and Rawanda School of Public Health.

Kailasam, L. (2017). Activity Based Method for purely financial items.*The Management Accountant*, 52 (5), 22-27.

Kane, R.A., Penrod, J.D., Davidson, G., Mosco, I. and Rich, (1991). What cost care managemet is long term care?, Social Service Review, 65(2), 281-303.

Kaplan, R.S and Porter, M.E. (2011). The Big Idea: How to solve the cost crisis in health care, *Harvard Business Review*, September.

Karmarkar, U.R., Shiv, B. and Knutson, B. (2015). Cost conscious? The neutral and behavioural impact of price primacy on decision making, *Journal of Marketing*, 11, 467-481.

Kennedy, D.M., Dales, S. and Nordeen, J.T. (2015). The Mayo mode of community: Integrating population health and patient experience initiatives for efficient reform, *Journal of Healthcare Management*, 60(2), 91-95.

Kenney, C. (2008). *The Best Practice*, US, US Public Affairs.

Kerala Costing Collaborative, Department of Economics, Government College Kasrgod and State Health Systems Resource Centre, Government of Kerala, Thiruvananthapuram (2014). *Costing Study for Designing Payment to Healthcare Service Provider*, Kerala: Government of Kerala.

Kerala Legislative Secretariat (2017). *The Kerala Clinical Establishements* (Registration and Regulation) Bill, 2017, Kerala, Government of Kerala.

Klarman, H.E. (1962). Role of Philanthropy in hospital, *Journal of Public Health*, August, 52(8), 1227-1237.

Klein, M. (2013). *A new brand for a new era – Marketing services*, 33, 18-26.

Kothari, R. and Godha, A. (2007). *Management Accounting – concepts and applications*, New Delhi, Macmillan Publishers India Private Limited.

Kotler, P. (2003). *Marketing Management* (11th ed.). India, Pearson Education.

Krause, J.H. (2006). A patient-centered approach to health care fraud recovery, *Journal of Criminal law and criminology*, 96(2), 577-580.

Krishnaswamy, M. (1996). Cost reduction through value analysis. *The Management Accountant*, 31 (6), 410-415.

Kumar, D. (2018). Science institutions in Colonial India: some snippets, some lessons, *Journal of History of Science*, 53(4), 23 – 31. DOI: 10.16943/ijhs/2018/v53i4/49521

Kunders, G.D. (2004). *Hospitals – Facilities planning and management*, New Delhi, Tata Mc Graw Hill Publishing.

Kurup, H.K.K (2012). *Provider Behaviour in the Healthcare Sector of Kerala,National Seminar on Universal health coverages in India seeking possibilities*, (17-33), Kasargod, Government College.

Kutty, R.V. (2000). *Historical analysis of development of healthcare facilities in Kerala State*, India, Health Policy and Planning.

Labro, E. (2015). Healthcare costs: Discussion of the impact of changes in regulation on cost behavior, *Contemporary Accounting Research*, 32(2), 567-574.

Lairson, D.R, Frye, N. (1987). Employee Health Cost Management: Information and Analysis at the level of the firm, *Journal of health and human resources administration*, 9(3).

Laueson, R.A. (2005). The use of ABC in healthcare Industry: 1994 Vs. 2004, *Research in healthcare in financial management*, 10(1), 77-94.

Lee, B. (2012). The Hidden Wealth of consumers: Realizing the untapped value of your most important asset, *Harvard Business Review*, June.

Lerner, J. (2012). The architecture of innovations: The economics of creative organizations, *Harvard Business Review*, September.

Levin, R.I. and Rubin, D.S. (1997) *Statistics for Management* (7th ed.), New Delhi, Prentice-Hall of India.

Levitz, G.S. and Brooks, P.P. (1985) Independent versus system – affiliated hospitals: a comparative analysis of financial performance, cost and productivity, *Health Service Research*, 20(3),315-319.

Lewis, T.E. (2013*). Cracking health costs*, New Jersey, Wiley Inc.

Li, L., Chen, Q. and Powers, D. (2012). *Chinese healthcare reform: a shift toward social development,* Sage Publications.

Lovelock,C. and Wirtz, J. (2004) *Services Marketing – People, Technology, Strategy* (5th ed.), Singapore, Pearson Education.

Lu, L., Gou, Q., Tang, W. and Zhang, J. (2016). Joint pricing and advertising strategy with reference price effect, *International Journal of Production Research*, 54 (17), 5250 – 5270.

Luck, D.J. and Rubin, R.S. (2005). *Marketing Research* (7th ed.). New Delhi, Prentice-Hall of India.

Luke, R.D., Walston, S.L and Plummer, P.M.(2006). *Healthcare strategy in pursuit of competitive advantage*, Chicago, Association of University Program.

Malhotra, N.K. and Dash, S. (2016). *Marketing Research – An applied orientation*, India, Pearson India Education Services Pvt. Ltd.

Mc Laughlin, D.B. and Hays, J.M (2009). *Healthcare Operations Management*, New Delhi, PHI Learning Pvt. Ltd.

Millan, D. (2014) Calculating cost savings in utilization management, *Clinica Clinicia Acta*, 123-126

Ministry of Statistics and Programme Implementation, Government of India.(2006). NSSO (Report No. 507 (60/25.0/1)

Mistry, H., Buxton, M., atuin, J. and Peveler, R. (2005). Comparison of General Practitioner Records and Patient Self. *The European Journal of Health Economics*, 6(3), 261-266.

Moni, V.S. (1994). Benchmarking. *The Management Accountant*, 29(11), 810-811.

Moore, S. (2014). *Cost and Management Accounting*, New Delhi, Random Publications.

Morissey, M..A. (2005) *Price Sensitivity in healthcare: Implication for healthcare policy,* Second Edition.

Muir, A.E. (1980). *Causal modelling for indirect cost management at University and colleges,* Research in Higher Education, 12(4), 291-230.

Mukherjee, S.P. (1999). Activity Based Costing (ABC): its development – a case study. *The Management Accountant*, 34 (1), 5-16.

Mukhopadhhyaya, A.K (2009) *Value Engineering mastermind – from concept to value engineering certification*, New Delhi, Response Books from SAGE.

Nair, P. (2016, October 20). Closing the coverage gap. *The Times of India*, p.2.

Natarajan, V. (1998). Need for cost cells in service sector. *The Management Accountant*, 33 (9), 676-686.

National Health Service of Scotland (2001). *Costs Book Manual 2000/01*.

Nguyet, T., Phar, Baird, K. and Blair, B. (2014). The use and success of activity based management practices at different

organizational life cycle stages, *International Journal of Production Research*, 52(3), 787-803.

Nicolau, J.L. (2009). The smile of the tourist: the relationship between price sensitivity and expenses, *The Service Industries Journal*, 29 (8), 1125-1134.

Nigam, B.M.L and Sharma, G.L. (1996). *The theory and techniques of Cost Accounting*, Delhi, Himalaya Publishing House.

Nishimura, K. G., (1989). Consumer Markets and Price Sensitivity. *The London School of Economics and Political Science*, 56 (222), 187-198.

Obrien, J.A., Patrick, A.R. and Caro, J.J. (2003). Cost of managing complications resulting from type two diabetes melltus in Canada, *BMC Health Services Research*, 7 (3), 25-28. Doi: 10.1186/1472-6963-3-7

Oxenfeldt, A.R (1975) *Pricing Strategies*, New York, AMACOM.

Pal, D. (2017). History of Medicine in India. *Dream 2047*, 19 (7), 25-27.

Palda, K.S (1971). *Pricing decisions and marketing policy*, New Delhi, Prentice-Hall Foundations of marketing series,

Patnaik, S. (2009). *A study on healthcare workflow*, University of Hyderabad, India.

Patro, S. and Kumar, V. (). Management Case: Apollo health and lifestyle limited: retail franchising in healthcare industry.

Prakash, G. (2015). Steering Healthcare Service Delivery: A regulatory perspective, *International Journal of Healthcare Quality Assurance*, 28(2), 173-192.

Raeesi.R. and Amini, A. (2013). Developing a grey activity based costing (G-ABC) method to capture the inherent uncertainty in identifying cost drivers consumption rates, *Financial Studies Journal*, 17(2), 41-47.

Raju, C.V.S.N. (2000). Value creation and strategy – creating value through business strategy. *The Management Accountant*, 35 (3), 167-169.

Raman, A.N. (2004). Operational cost management through cost based feedback and learning mechanism. *The Management Accountant*, 39 (11), 865-872.

Rao, Vithala R. (1984). Pricing research in marketing: *The state of the art. Journal of Business*, 57, 39–60.

Reddy, A.H.H.N, Krishna, G.R. and Rao, K.V. (2012). *Consumer Behaviour and Retail Management*, New Delhi, Manglam Publications.

Reeve, J.M and Lamont, W.G. (2000). *Readings and Issues in Cost Management*, Canada, South-Western College Publishing.

Russell, M. (2012). New information in continuous disclosure, *Pacific Accounting Review*, 27(2), 229-263.

Saha, A. (2001). Activity Based Cost Management – an approach to ascertain product cost more accurately, *The Management Accountant*, 36(8), 568-571.

Salem, N.H. and Chebat, J.C. (2014) The double edge sword: The positive and negative effects of switching costs on consumer exit and revenge, *Journal of Business Research*, 67, 1106-1113.

Sarin, S. (2014). *Business Marketing (Concepts and Cases)*, McGraw Hill Education.

Sengupta, A. and Mondal, S.K. (2009). Efficiency and financing in catering primary healthcare to the poor: A study of rural health services in India, *Journal of Health Management*, 11(3), 23-55.

Sengupta, S. (2005). *Brand Positioning* (2nd ed.), New Delhi, Tata Mc Graw Hill Publishing Co. Ltd.

Shah,A.(2010). Putting Kerala Model to rest: lessons for a new era of development in India, *The American Enterprise Institute working paper series on development policy*.

Shank, J.K. (2001). *Cases in Cost Management – A strategic emphasis* (2nd ed.). Canada, South-Western College Publishing.

Sharma, R. and Ratnatunga, J. (1997). Teaching note: traditional and activity based costing systems, *Accounting Education*, 6(4), 337-345.

Sinha, R.K. (2013). Cost Effectiveness Analysis (CEA) of healthcare intervention: the emerging role of CMAs. *The Management Accountant*, 48 (9), 1036-1041.

Sloan, F.A., Morrisey, M.A., and Valvona, J. (1988). Effects of the Medicare prospective payment system on hospital cost containment: an early appraisal. *The Milbank Quarterly*, 66 (2), 191-220.

Smith, H. L., Fottler, M.D. and Saxberg, B.O. (1981), Cost Containment in Healthcare: A mode for Management Research, *Academy of Management*, 6(3), 397-407.

Srinivasan, S.R. (1994). Mastering the change process. *The Management Accountant*, 29(11), 807-809.

Stratton, W.O, Disroches, D., Lawson, R.A. and Hatch, T. (2009). Activity Based Costing: Is it still relevant?, *Management Accounting Quarterly*, 10(3), 31- 40.

Suh, H.S and Lee, S.M. (2012).Social values and healthcare priority setting in Korea, *Journal of health Organization and Management*, 26(3), 343-350.

Swenson,D. (2000). Managing costs through complexity reduction at carrier corporation. *The Management Accountant*, 35 (3), 191-192.

Taher, A. and El Basha, H. (2006).Heterogeneity of consumer demand opportunities for pricing of services, *Journal of product and brand management*, 15 (5), 331-340.

Tan, S.S., Rutten, F.F.H., Ineveld, B.M.V., Rdekop, W.K. and Hakkaartvan, L. (2009). Comparing methodologies for cost estimation of hospital services, *The European Journal of Health Economics*, 10(1), 39-45.

Taylor, D.W. (2016). Rethinking the financing of healthcare in Canada, *Healthcare Management Forum*, 29 (6), 260-263.

The Institute of Cost Accountants of India (2015). *Asian Summit on Healthcare Cost Management*, New Delhi: ICAI

Thomas, B.W. (1965) *Encyclopedia of cost Accounting*, Englewood cliffs: Prentice Hall International, 2, 413-442.

Tillmann, P.A., Tzortzopoulos, P. and Formoso, L.T. (2010). Redefining healthcare infrastructure: moving toward integrated solutions, *HERD*, 3(2), 84-96.

Tomar, A. and Dhiman, A. (2013). Exploring the role of HRM in service delivery in healthcare organizations: A study of an Indian hospital, *Vikalpa*, 38 (2), 13-25.

Tomic, V.P and Andrijasevic, M (2014). Cost Management in the internal value chain of integrated application of ABC, Kaizen concept and target costing, *Megatrend revija ~ Megatrend Review*, 11(4), 365-380.

Toulemon, L. (2017). Regional purchasing groups and hospital medicine prices: evidence from group creations. *HEDG Health, Econometrics and data group*, 17 (21), 1-30 Retrieved from:

Tulsian, P.C. (2008). *Tulsian's practical costing*, New Delhi, S. Chand and Co. Ltd.

Twubakane Decentralization and Health project (2008). *Rwanda Health Centre and Hospital Cost Study*, Rwandan Ministry of Health.

Vairamuthuvel, R. (1995). Benchmarking – the essence of global trade. *The Management Accountant*, 30 (3), 214-215.

Vazakidis,A., Karagiannis, I. and Tsialta, A. (2010) Activity Based Costing in the Public Sector, *Journal of Social Science*, 6 (3), 376-382.

Walshe, K. and Smith, J. (2011). *Healthcare Management* (2nd ed.), Mc Graw Hill Education.

Weil, R.L. and Maher, M.W. (2005). *Handbook of Cost Management* (2nd ed.). United States, John Wiley and Sons Inc.

White, J. (2007). Markets and Medical Care: The United States, 1993-2005, *The Milibank Quarterly*, 85 (3), 395-448.

World Bank (1993). *World Development Report 1993: Investing in Health*. New York: Oxford University Press.

Zaltmans, G. (2003). *How consumers think: Essential Insights into the Mind of the Market*, Harvard Business School Press.

Zarei, B., Rad, R.S., Ghapanchi, F. and Ghapanchi, A.H. (2015). A heuristic approach to the adoption and implementation of activity based costing information systems, *The Electronic Journal of Information Systems Evaluation*, 18(1), 60-64.

Zigmer, D.K. (2013). An argument for the interaction of healthcare management with public health prince, *Journal of Healthcare Management*, 58(4), 253-257.

Websites

http://accounting.about.com/od/Accounting/fl/Do-You-Know-Your-Productrsquos-Total-Cost.htm (Retrieved on 14th September, 2018)

http://ajcc.aacnjournals.org/content/23/4/325.full (Retrieved on 7th January, 2016)

http://annals.org/article.aspx?articleid=723406&issueno=10&atab=10 (Retrieved on 28th November, 2017)

http://annals.org/article.aspx?articleid=723406&issueno=10&atab=10 (Retrieved on 19th August, 2016)

http://blog.credihealth.com/rising-cost-healthcare-india/ (Retrieved on 11th July, 2016)

http://jama.jamanetwork.com/article.aspx?articleid=197994 (Retrieved on 22nd April, 2017)

http://jama.jamanetwork.com/article.aspx?articleid=197994 (Retrieved on 22nd March, 2017)

http://managinghealthcarecosts.blogspot.in/

http://managinghealthcarecosts.blogspot.in/ (Retrieved on 15th July, 2017)

http://mobihealthnews.com/29400/8-companies-working-on-price-transparency/

http://www.accountingtools.com/questions-and-answers/what-is-under-absorption-and-over-absorption-of-overhead.html (Retrieved on 30th June, 2015)

http://www.cognex.com/Manufacturing-Cost-Reduction-and-Process-Optimization.aspx?pageid=11409&langtype=1033 (Retrieved on 18th June, 2018)

http://www.dummies.com/how-to/content/what-is-peanut-butter-costing.html (Retrieved on 31st March, 2018)

http://www.healthcarefinancenews.com/news/7-ways-lean-healthcare-management-reduces-cost (Retrieved on 18th January, 2017)

http://www.mfe.govt.nz/publications/waste/management-end-of-life-tyres-jan04/html/page1.html (Retrieved on 21st December, 2016)

http://www.nabh.co/allopathic-Standards.aspx (Retrieved on 25th July, 2015)

http://www.nabh.co/allopathic-Standards.aspx (Retrieved on 2nd April, 2016)

http://www.ncbi.nlm.nih.gov/pubmed/10137614 (Retrieved on 19th July, 2016)

http://www.nejm.org/doi/full/10.1056/NEJMp0809794 (Retrieved on 19th June, 2018)

http://www.sciencedirect.com/science/article/pii/S1478409208000459 (Retrieved on 19th July, 2015)

http://www.sphconsultants.com/icsi/ssioverview.htm (Retrieved on 3rd January, 2018)

http://www.sphconsultants.com/icsi/ssioverview.htm (Retrieved on 14th October, 2018)

http://www.thehackettgroup.com/business-cost-management/ (Retrieved on 23rd August, 2018)

http://www.velaction.com/definition-activity-based-costing/ (Retrieved on 25th June, 2017)

http://www.wisegeek.com/what-is-a-peanut-butter-approach.htm (Retrieved on 20th October July, 2017)

https://www.aetna.com/individuals-families/member-healthcare-cost-management.html (Retrieved on 25th February, 2018)

https://www.isixsigma.com/implementation/case-studies/bridging-functional-silos-achieve-consumer-impact/ (Retrieved on 12th February, 2016)

https://www.mbaskool.com/business-concepts/operations-logistics-supply-chain-terms/15183-functional-silo.html (Retrieved on 10th September, 2018)

https://www.questia.com/magazine/1G1-1643762/japanese-cost-management-practices (Retrieved on 17th July, 2016)

https://www.quora.com/Does-Peanut-Butter-spread-accounting-cause-businesses-to-make-poor-pricing-decisions (Retrieved on 12th October, 2017)

https://www.ukessays.com/essays/psychology/explanation-of-the-concept-of-research-onion-psychology-essay.php (Retrieved on 23rd November, 2018)

APPENDICES

Appendix I

INTERVIEW SCHEDULE

(Hospital Management)

Hospital Name: Type:

Ownership: Sole (Medical/Non-Medical) / Partnership/Trust/ Company/Corporate

No. of Departments: Quality Accreditation: Yes_____ /No

No. Of Years Hospital being established: Bed Capacity:

Average occupancy per day: OP- IP-

Average monthly:

Lab Test X-Ray Surgery

1. What is **Value** in healthcare according to your organisation? (Proportion in 100 points)

   a. Cost [ ] b. Quality [ ]

   c. Brand [ ] d. Facilities [ ]

2. Does the consumers take Medical Insurance benefits?

   _____

3. What is the pricing strategy of your organisation?

   a. Rule of thumb [ ]

   b. Market ruled [ ]

   c. Cost based pricing [ ]

   d. Target pricing [ ]

4. How do you rate the importance of cost management in your organisation?

   _____

5. What causes cost in your institution? (Proportion in 100 points)

   a. Material [ ]

   b. Doctors [ ]

   c. Other staffs [ ]

   d. Technology [ ]

   e. Quality [ ]

6. Pricing of services are often targeted by consumer complaints.

   a. Always [ ] b. Frequently [ ]

   c. Often [ ] d. Occasionally [ ]

   e. Sometimes [ ] f. Rarely [ ]

   e. Never [ ]

7. Technology has dominated the healthcare industry.

   a. Always [ ] b. Frequently [ ]

   c. Often [ ] d. Occasionally [ ]

   e. Sometimes [ ] f. Rarely [ ]

   e. Never [ ]

8. Manpower has been taken over by technology in Healthcare sector.

   a. Strongly Agree [ ]

   b. Agree [ ]

   c. Somewhat Agree [ ]

   d. Neither Agree or disagree [ ]

   e. Somewhat Disagree [ ]

   f. Disagree [ ]

   g. Strongly Disagree [ ]

9. The technology used is appropriate to its service and the price is increased thereby.

a. Always	[ ]	b.Frequently	[ ]
c. Often	[ ]	d. Occasionally	[ ]
e. Sometimes	[ ]	f. Rarely	[ ]
g. Never	[ ]		

10. How do you rate your organization's competitive capacity?

_____

11. How does the following criteria evaluate a service in your organisation? (Proportion in 100 points)

a. Consumer satisfaction	[ ]	b. Cost	[ ]
c. Quality	[ ]	d. Brand	[ ]

12. Cost has been a matter of the organisation's pricing policy.

a. Always	[ ]	b.Frequently	[ ]
c. Often	[ ]	d. Occasionally	[ ]
e. Sometimes	[ ]	f. Rarely	[ ]
g. Never	[ ]		

13. Has evaluation of cost part of your periodic practice?

a. Yes [ ] b. No [ ]

14. If yes, what is the periodicity?

a. Daily	[ ]	b. Weekly	[ ]
c. Fortnightly	[ ]	d. Monthly	[ ]
e. Quarterly	[ ]	f. Half Yearly	[ ]
g. Annually	[ ]		

15. Which departments earn the highest profit?

_____

16. Which departments earn the highest loss?

_____

17. What is the margin for indirect expenses in your organization?

    _____

18. What is the proportion of cost elements for the following services?

Sl. No.	Services	Cost Elements
1.	Consultation service	M L O
2.	Surgical service	M L O
3.	Radiology service	M L O
4.	Laboratory service	M L O

19. There is an important role for cost in competition.

    a. Strongly Agree [ ]
    b. Agree [ ]
    c. Somewhat Agree [ ]
    d. Neither Agree or disagree [ ]
    e. Somewhat Disagree [ ]
    f. Disagree [ ]
    g. Strongly Disagree [ ]

20. What is the cost dominance level in choosing a service of your organisation?

    _____

21. Cost planning has been part of the management execution.

a.	Always	[ ]	b.	Frequently	[ ]
c.	Often	[ ]	d.	Occasionally	[ ]
e.	Sometimes	[ ]	f.	Rarely	[ ]
g.	Never	[ ]			

22. Execution of cost planning is considered critical in the organisation.

a.	Always	[ ]	b.	Frequently	[ ]
c.	Often	[ ]	d.	Occasionally	[ ]
e.	Sometimes	[ ]	f.	Rarely	[ ]
g.	Never	[ ]			

23. Is there a costing system present in your organisation?

a.	Yes	[ ]	b.	No	[ ]

24. If yes, are you satisfied with the costing system?

a.	Completely Satisfied	[ ]
b.	Mostly Satisfied	[ ]
c.	Somewhat Satisfied	[ ]
d.	Neither Satisfied or Dissatisfied	[ ]
e.	Somewhat Dissatisfied	[ ]
f.	Mostly Dissatisfied	[ ]
g.	Completely Dissatisfied	[ ]

25. The current cost appropriation method of the organization is acceptable.

a.	Always	[ ]	b.	Frequently	[ ]
c.	Often	[ ]	d.	Occasionally	[ ]
g.	Never	[ ]	f.	Rarely	[ ]
e.	Sometimes	[ ]			

26. Benchmarking is a part of the management system.

a. Always [ ] b. Frequently [ ]

c. Often [ ] d. Occasionally [ ]

e. Sometimes [ ] f. Rarely [ ]

g. Never [ ]

27. On what basis benchmarking criteria is determined?

a. Strongest Competitor [ ]

b. Best Practice [ ]

c. Other _____

28. The organisation has consulted for a better cost management.

a. Always [ ] b. Frequently [ ]

c. Often [ ] d. Occasionally [ ]

e. Sometimes [ ] f. Rarely [ ]

g. Never [ ]

29. Redesigning is a part of the control technique of the organisation.

a. Always [ ] b. Frequently [ ]

c. Often [ ] d. Occasionally [ ]

e. Sometimes [ ] f. Rarely [ ]

g. Never [ ]

30. How much cost reduction is possible by redesigning the service? (in percentage)

_____

31. Which of the following is mostly centred for medical services?

a. Cost Centre [ ] b. Profit Centre [ ]

32. Which of the following is mostly centred for medical support services?

a. Cost Centre [ ] b. Profit Centre [ ]

33. What remedies are followed to improve the utilization?

_____

_____

34. What is the level of cost optimization for the following service?

Sl. No.	Services	Percentage
1.	Consultation service	
2.	Surgical service	
3.	Radiology service	
4.	Laboratory service	

35. How much priority do you attach for cost reduction?

Very Much ○ ○ ○ ○ ○ ○ ○ Not at all
7 6 5 4 3 2 1

36. Real and permanent reduction influence better management.

a. Always [ ] b. Frequently [ ]
c. Often [ ] d. Occasionally [ ]
e. Sometimes [ ] f. Rarely [ ]
g. Never [ ]

37. Recording cost has been manageable in reducing cost.

a. Always [ ] g. Never [ ]
c. Often [ ] d. Occasionally [ ]
b. Frequently [ ] f. Rarely [ ]
e. Sometimes [ ]

38. The organisational services are valued separately.

a. Always [ ] b. Frequently [ ]
c. Often [ ] d. Occasionally [ ]
e. Sometimes [ ] f. Rarely [ ]
g. Never [ ]

39. What is the level of importance given for valuing the service? (in percentage)

_____

40. An alternative material chosen has greatly changed the cost.

a.	Always	[ ]	b.	Frequently	[ ]
c.	Often	[ ]	d.	Occasionally	[ ]
e.	Sometimes	[ ]	f.	Rarely	[ ]
g.	Never	[ ]			

41. An alternative labour chosen has greatly changed the cost.

a.	Always	[ ]	b.	Frequently	[ ]
c.	Often	[ ]	d.	Occasionally	[ ]
e.	Sometimes	[ ]	f.	Rarely	[ ]
g.	Never	[ ]			

42. What factors are chosen as favourable situation for an alternative?

_____

_____

43. Bulk Purchase is a tactic in cost reduction.

a.	Always	[ ]	b.	Frequently	[ ]
c.	Often	[ ]	d.	Occasionally	[ ]
e.	Sometimes	[ ]	f.	Rarely	[ ]
g.	Never	[ ]			

44. What is the level of change in cost influenced by bulk purchase?

_____

_____

45. What kind of materials are protected by bulk purchase?

_____

_____

46. Outsourcing is influential to the techniques of cost control.

a. Always [ ] b. Frequently [ ]

c. Often [ ] d. Occasionally [ ]

e. Sometimes [ ] f. Rarely [ ]

g. Never [ ]

47. Are you aware of the ABC costing technique?

a. Yes [ ] b. No [ ]

48. Do you think such a method can improve the cost of your service?

Very Much ○ ○ ○ ○ ○ ○ ○ Not at all

7 6 5 4 3 2 1

49. ABC evaluates better costing technique for healthcare sector.

a. Always [ ] b. Frequently [ ]

c. Often [ ] d. Occasionally [ ]

e. Sometimes [ ] f. Rarely [ ]

g. Never [ ]

50. What is the percentage of resource consumption for the following Services?

S.No	Services	Percentage
1.	Medical Services	
2.	Medical Support Services	
3.	Non - Medical Support Services	

51. Does measure of activities follow your costing system?

a. Always [ ] b. Frequently [ ]

c. Often [ ] d. Occasionally [ ]

e. Sometimes [ ] f. Rarely [ ]

g. Never [ ]

52. What are the activities involved in each of the following services?

S.No	Services	Activity
1.	Consultation service	Activity I
		Activity II
		Activity III
		Activity IV
		Activity V
2.	Surgical service	Activity I
		Activity II
		Activity III
		Activity IV
		Activity V
		Activity VI
		Activity VII
		Activity VIII
		Activity IX
3.	Radiology service	Activity I
		Activity II
		Activity III
		Activity IV
		Activity V
4.	Laboratory service	Activity I
		Activity II
		Activity III
		Activity IV
		Activity V

53. Name three drivers mostly used to analyse overhead cost.
    a. _____
    b. _____
    c. _____

54. Which among the following are your considered drivers in cost?

    a. Duration of surgery [ ]
    b. Cost per surgery [ ]
    c. Number of surgery [ ]

d. Hour of stay [ ]
e. Department wise number of investigation [ ]
f. Number of hours for which AC is working [ ]
g. Proportionate area and calculation of common area [ ]
h. Cost of power based on number of service done [ ]
i. Number of sessions per patient [ ]
j. Cost per admission per day [ ]
k. Cost per hour [ ]
l. Cost per day per bed [ ]
m. Type of surgery [ ]

55. What are the major identifiable cost drivers for the following services?

S.No	Services	Cost Driver
1.	Consultation service	1. 2. 3.
2.	Surgical service	1. 2. 3.
3.	Radiology service	1. 2. 3.
4.	Laboratory service	1. 2. 3.

56. What is the level of public influence in your budget preparation? (in percentage)

_____

57. Pricing the services have mutual interest with the behaviour of the public.

Very Much	○	○	○	○	○	○	○	Not at all
	7	6	5	4	3	2	1	

58. What is the level of price ruled by the competitors? (in percentage)

_____

59. What is the priority given for the consumers' behaviour while costing a service?

Very Much	○	○	○	○	○	○	○	Not at all
	7	6	5	4	3	2	1	

60. To what extent does a change in price affect the organisation?

Very Much	○	○	○	○	○	○	○	Not at all
	7	6	5	4	3	2	1	

61. What is the level of organisation's awareness about consumers' cost consciousness? (in percentage)

_____

62. How do you rate the price sensitivity of your consumers? (in percentage)

_____

Appendix II

INTERVIEW SCHEDULE

(Patient)

Age: Income: Gender:

No. of Visits: 1-3 [ ] 3-6 [ ] 6-9 [ ] 9-12 [ ] Above 12 [ ]

Residence: Rural [ ] Semi – Urban [ ] Urban [ ]

Social Class: Lower class [ ] Middle lower [ ]
Middle middle [ ] Middle upper [ ]
Upper class [ ]

1. Which of the following services have you been for?
   a) Consultation Service [ ]
   b) Surgical Service [ ]
   c) Laboratory Service [ ]
   d) Radiology Service [ ]
   e) Any Other _____

2. What is the total cost for the service attained?
   a) Below Rs.2000 [ ]
   b) Rs.2000 – Rs. 5000 [ ]
   c) Rs. 50000 – Rs. 10000 [ ]
   d) Rs. 50000 – Rs. 10000 [ ]
   d) Above 20000 [ ]

3. Cost of the service is within the budgeted amount.
   a. Always [ ] b. Often [ ]
   c. Sometimes [ ] d. Rarely [ ]
   e. Never [ ]

4. Which of the elements do you think cost more often in a service?

   (Rank according to your preference)

   a) Consumables [ ]
   b) Doctors [ ]
   c) Nurses [ ]
   d) Electricity [ ]
   e) Housekeeping [ ]
   d) Equipment [ ]
   e) Other [ ]

5. For choosing a hospital, detailed analysis on the financial aspects is done

   a) Always [ ] b) Often [ ]
   c) Sometimes [ ] d) Rarely [ ]
   e) Never [ ]

6. Mark the level of your preference for a visit to the hospital.

   [Mark in 100 points]

   a) Convenience[ ] c) Affordable [ ]
   b) Time [ ] d) Any other _____

7. Do you think you are charged more for the service?

   a) 80% -100% [ ] b) 60% - 80% [ ]
   c) 40% - 60% [ ] d) 20% - 40% [ ]
   e) 0% - 20% [ ]

8. What is the transparency level of price?

   a) 80% - 100% [ ] b) 60% - 80% [ ]
   c) 40% - 60% [ ] d) 20% - 40% [ ]
   e) 0% - 20 [ ]

9. What is cost according to your terms in a hospital?

[Mark in 100 points]

a) Expenses [ ] b) Time [ ]

c) Quality [ ] d) Other [ ]

10. How do you rate your price sensitivity?

a) 80% - 100% [ ] b) 60% - 80% [ ]

c) 40% - 60% [ ] d) 20% - 40% [ ]

e) 0% - 20% [ ]

11. Are you satisfied with the current pricing system?

a) 80% - 100% [ ] b) 60% - 80% [ ]

c) 40% - 60% [ ] d) 20% - 40% [ ]

e) 0% - 20% [ ]

12. The services are fairly charged.

a) Every time [ ] b) Usually [ ]

c) Frequently [ ] d) Sometimes [ ]

e) Occasionally [ ] f) Rarely [ ]

g) Never [ ]

13. The hospital is often targeted by consumer complaints in pricing of services.

a) Always [ ] b) Often [ ]

c) Sometimes [ ] d) Rarely [ ]

e) Never [ ]

14. Is quality effective in the organisation?

a) 80% - 100% [ ] b) 60% - 80% [ ]

c) 40% - 60% [ ] d) 20% - 40% [ ]

e) 0% - 20% [ ]

15. Pricing the services have mutual interest with the behaviour of the public.

a) Extremely Influential [ ]

b) Very Influential [ ]

c) Somewhat Influential [ ]

d) Slightly Influential [ ]

e) Not at all Influential [ ]

16. At what level of difference do you make a switchover from the hospital? (in percentage)

_____

17. Price comparison for the service is part of choosing a hospital.

a) Always [ ] b) Often [ ]

c) Sometimes [ ] d) Rarely [ ]

e) Never [ ]

18. Are you a Medical Insurance policy holder?

a) Yes [ ] b) No [ ]

19. Rate the difference in price for a medical insurance holder.

a) 80% - 100% [ ] b) 60% - 80% [ ]

c) 40% - 60% [ ] d) 20% - 40% [ ]

e) 0% - 20% [ ]