Editorial

Lessons from Obama Care

The United States of America (USA) has tried to revolutionize healthcare delivery to its citizens by ushering in Obama care (The Patient Protection and Affordable Care Act). It is important to analyze and understand why a seemingly populist scheme with all noble intentions is facing so much of hurdle in implementation. The understanding of the nuances will provide insight to the planners of healthcare policy to deliberate extensively before deciding on any similar policy.

Presently in US, there are about 32 to 50 million people who do not have health insurance. In case of hospitalization, they are often not in a position to foot the bill. Obama care has been designed to provide quality care and increase the accessibility and affordability of health insurance to the general populace of USA. In exchange, most people, who can afford to, must obtain health coverage by 2014 or pay a per month fee. The law eliminates pre-existing conditions, stops insurance companies from dropping you when you are sick, protects against gender discrimination, expands free preventative services and health benefits, expands medicaid and CHIP (Children's Health Insurance Programme), mandates larger employers insure employees, creates a marketplace for subsidized insurance providing tens of million individuals, families and small businesses with free or low-cost health insurance, and decreases healthcare spending and the deficit.

The highlights of Affordable Care Act (ACA) are as follows:

Most people who currently have health insurance can keep it. It creates states-based health insurance exchange marketplaces where federally regulated and subsidized insurances are available. Young adults can stay on their parents' plan until 26. It requires that all plans cover 10 essential health benefits such as outpatient care, emergency services, inpatient care, maternity services, mental health services, rehabilitative services, lab services, pediatric services, precription drugs, etc. Preventive services are free.

If health coverage is not there, then new health insurance plan can be bought from private insurance plan. Open enrollment in the health insurance marketplace till March 31st, 2014. If you do not obtain coverage or an exemption by 1st January 2014, you must pay a per-month fee on your federal income tax return for every month you are without health insurance.

The cost of marketplace health insurance works on a sliding scale. Those who make less, pay less. American making less than $45,960 as individual or $94,200 as a family of four may be eligible for premium tax credits through the marketplace. If you are able to get qualified health insurance through your employer, you would not be able to receive marketplace tax credits unless the employer does not cover at least 60% of your premium cost, does not provide quality insurance or provides insurance that exceeds 9.5% of your families income.

Up to 82% of nearly 16 million uninsured young US adults will qualify for federal subsidies or medicaid through the marketplace. The ACA does away with pre-existing conditions and gender discrimination so these factors will no longer affect the cost of your insurance on or off the marketplace. Health coverage cannot be denied based on health status. Health insurers cannot place lifetime limits on your coverage. As of 2014, annual limits are eliminated as well.

All new plans sold on or off the marketplace must include a wide range of new benefits, including wellness visits and preventive tests and treatments at no additional out-of-pocket cost. All full-time workers who work for companies with over 50 employees must be offered job-based health coverage by 2015. Employers who do not offer coverage will pay a per-employee fee.

Small businesses with under 50 full-time employees can use a part of the marketplace called the SHOP (small business health options program) to purchase group health plans for their employees. Small businesses with under 25 full-time employees can use the marketplace to purchase subsidized insurance for their employees.

Companies must spend at least 80% of premiums on providing actual medical services. If they spend it on advertizing or executive salaries, they have to pay the excess back to policyholders.

Challenges

The various hurdles that the US administration is facing are as follows:

Increased coverage may actually raise the overall healthcare costs in the short-term as preventive care and screening tests will add up to the cost. To make it work financially, millions of uninsured must sign up for medical coverage, especially younger, healthier people, and that is very much in doubt right now.

Obama care's long-term nursing plan for the elderly has been repealed after the administration concluded that it was financially unworkable. About half the states have decided against creating their own health insurance exchanges, a central pillar in the system, letting the federal government run the exchanges instead.

With so many Americans out of work, it is difficult to justify forcing people to buy insurance they do not want or their present priorities are different. Small businesses will reduce their workforce below the 50-worker level or cut part-time hours to escape the mandate altogether.

Obama care purports to finance itself with taxes only on upper-income Americans. The revenues from these taxes will be inadequate to sustain this scheme. This mode of finance will corrode all political incentive for cost control. Not many voters will deprive themselves of a benefit to save somebody else money.

No system is perfect, but the Affordable Care Act aims to reform the American Health Care system toward the favor of the people and away from the favor of corporations and stockholders. Obama care's many provision give new patient protections in dealing with insurance companies and in return mandates that everyone who can afford to must obtain health insurance by 2014 or pay a fee.

As it is evident from the above, it is imperative that, in any country, the government must plan its long-term policies and programs taking all stakeholders into confidence. It is important to understand that taxpayer's money should be spent so as to benefit the maximum clientele.

Editors

Guest Editorial

Leadership in Healthcare

Good leadership is important for the success of any organization. Harold Knootz, Cyril O'Donnell and Heinz Weihrich have called the leadership is the 'art or process of influencing people so that they will survive willingly toward the achievement of group goal'. Actually, it is the process by which people are directed, guided and influenced to achieve stated objectives by successfully implementing a plan of action. In a healthcare organization, good leadership is more than just important—it is absolutely critical to the organization's success. For a healthcare organization, the primary goal is to provide high-quality safe care to those who seek its help, whether they are patients, residents, clients or recipients of care. So, how does leadership influence organizational delivery? Leadership has been described as the behavior of an individual when directing the activities of a group toward a shared goal. Thus, it is important that the leader is extremely clear of the end objectives and the path to be taken to achieve the same. The competency level of healthcare leader should be very high as that will help him to handle complex issues and lead from front.

Effective leadership and management have been found to contribute to efficiency of healthcare services, performance and satisfaction of the staff employed within them. Bradley and Alimo Metcalfe (2008) researched the casual relationship between leadership behavior and the performance and productivity of the staff and found that 'engaging leadership' improve employee engagement and performance. This outcome, I have personally seen while serving in different service hospitals. Good leadership skills can provide good impact on patient safety and quality of care. We now have evidence to claim that leadership plays an important and significant role in formulation of a strategy that is driven by quality of healthcare services to be provided to the clientele.

If we want a healthcare organization to succeed, it must be appreciated as a system, the components of which work together to create success. It is not possible to determine what each component should be and do unless it is examined in the light of the goals for the system and the rest of the system's components. Healthcare systems are composed of numerous professional groups, departments and specialties with intricate, nonlinear interactions between them; the complexity of such systems is often unparalleled as a result of constraints relating to different disease areas, multidirectional goals and multidisciplinary staff. Within large organizations, such as healthcare systems, the numerous groups with associated subcultures might support or be in conflict with each other. Leadership needs to capitalize on the diversity within the organization as a whole and efficiently utilize resources when designing management processes, while encouraging personnel to work toward common goals.

Healthcare delivery systems are complex entities that must merge the best of administrative and clinical practices into a new model of leadership. But, despite growing recognition that healthcare organizational leaders must partner with clinical leaders to address patient safety, evidence-based practice, financial sustainability and capacity, tensions between the groups remain. Healthcare is based in large, bureaucratic entities organized in administrative hierarchies with clinical or product line silos that thwart collaboration, limit inter-disciplinary engagement, and foster mistrust. Around the world healthcare accessibility, fragmentation and affordability issues challenge healthcare systems whether they are centralized, socialized systems or free market private and public enterprises. In response to these concerns, healthcare organizations are struggling to address the 'how' of integrating clinician competence in patient management with the financial imperatives of modern day delivery systems. The delivery of healthcare today depends on a growing group of professionals coming together as an interdisciplinary team. At the same time, there are many forces that are shaping the delivery of healthcare. Many of these changes are being driven by the markets, changes in concepts of health and well-being, technology, and research and discovery. Yet, it is only through dynamic leadership that the professions themselves will be in a position to guide these transformations.

Leadership has a significant role in choosing the strategy for implementation. The leadership has to look at the forest and not the trees and take a broader and bolder view while formulating the strategy. The strategy cannot be focused in parts and will have to address all aspects of safe and quality oriented patient centric care. Leadership has to ensure that ownership of strategy is with everyone.

An important characteristic of a good leader is the ability to explore personal and team motives/beliefs in accomplishing a change or perceived vision of success. As part of this process, true leadership requires the ability to critically appraise the team process and outcomes on the path to achieve a shared goal. Leadership requires constant fine tuning of self as well as

reflection on the individual needs and characteristics of the team. Clinicians should have an insight into leadership styles and responsibilities in order to gain a deeper understanding of the attributes required of being or supporting 'leaders' within the organization. A number of leadership approaches can be adapted to the healthcare setting to optimize management in this highly complex environment.

Many theories, cases and models have influenced the current leadership strategies that can be applied to the healthcare setting. Guidance for effective leadership should focus on the dynamic relationships between leadership values, culture, capabilities and the organizational context. The leader's developmental journey must operate within this dynamic, environment supported by a high level of self, team and organizational awareness. Healthcare systems that are serious about transforming themselves must harness the energies of physicians as organizational leaders and physicians who are equal to the task must supplement their medical training with training in business and management.

Current research evidence shows that there is a need for not just formal administrative leadership, but also a need to develop integrated leadership processes throughout healthcare delivery systems.

From my perspective, there is no infallible step-by-step formula for becoming an effective or transformational leader. Leadership requires an understanding of human nature. My assertion is that leadership can be taught and learnt. Specifically, a person can observe and internalize select models of leadership from unique environments, and then use these 'lessons learnt' to foster a potential for leadership by learning about what is worked for others. By selecting 'best practices', one can readily and selectively apply those lessons learned to one's own situation. Many of the contemporary authors who describe the traits, attributes and actions that typify successful leaders can find that virtually all of the current leadership philosophy was recognized thousands of years ago.

Leadership is the central issue since the quality initiative cannot achieve the desired outcomes if there is lack of constant and consistent leadership support at all level for the actions being taken. For effective, as a leader you have to be in possession or information that is relatively accurate, relevant and timely. In addition, leadership is also responsible for providing information to the providers as well as the recipients of healthcare. Leadership has to encourage and monitor adherence to legislation and voluntary adoption of accreditation at varying levels. These will help in changing performance since this would require external assessments and approvals.

The future of healthcare is a topic that has significant importance to patients and caregivers alike for generations to come. As the healthcare industry becomes more complex, leadership and the examination of how to most effectively apply it to meet efficiency standards and optimize the patient experience will become paramount.

As per my opinion, following role should be worth considering for leaders in healthcare:

- Teaching
- Inspiring confidence
- Empowering
- Improving performance — supporting reflection/clinical supervision
- Rewarding and recognizing individual contributions
- Recognizing the needs of the service from clinically-based environment
- Leading an developing services — implementing change
- Supporting the organization and, when necessary, providing a bridge between senior management and team members/ employees in informing, supporting and developing national agreed initiatives/government initiatives.

As a leader, I feel following leadership role in setting quality culture in healthcare setting:

- Develop quality culture
- Remove uncertainties and ambiguities
- Develop culture that emphasizes performance improvement
- Make the culture patient centric
- Ensure a blame free culture
- Cultivate the wanted culture by showing commitment, discipline, enthusiasm and involvement
- Resort to story-telling wherever applicable and relevant
- Devise policies and procedures to implement strategy
- Share success stories.

As a leader, one of the most significant roles of leadership in framing a strategy for quality improvement is building of teams. Quality improvement cannot be achieved by one person working alone or groups of persons working in an uncoordinated manner. All leaders in an organization should take following steps in setting quality driven strategy:

- Help in defining mission, vision, goals and plan
- Ensure quality in structure, process and outcomes in an integral part of the strategic plan

- Revise them when necessary
- Develop strategic plan that is aligned with quality
- Prioritise objectives
- Translate overall objectives into departmental objectives
- Annual initiative should be linked with the strategic plan
- Educate and empower all concerned.

Leadership must believe that all sentinel events involve a failure in the systems and processes which led to the event. A healthcare organization's success rests on leadership skills. In order to be successful within this new paradigm, leaders must:

- *Have an understanding of system*: Leaders must be able to identify opportunities for improvement. They must understand how clinical handoffs are supposed to happen, understand where in the care delivery process things go smoothly and can easily identify opportunities for improvement.
- *Understand strategic planning*: They must participate in and be prepared to lead strategic-planning and decision-making sessions. Physician insight into what steps an organization may undertake to accomplish organizational goals, based on improving clinical care delivery using the right resources, is key.
- *Navigate the transition to value-based care*: Leaders must play a significant role in championing the transition from current payment models to value-based care models and will need to understand the nuances of value-based care.
- *Understand data and data analytics*: Leaders must understand data, data warehousing and data analytics. They must be able to use data in order to identify trends and improvement opportunities, make decisions, monitor improvements, and determine whether implemented interventions are having the desired effect.
- *Understand finance*: Under accountable care and other emerging payment models where financial risk is assumed by the entity, an increased understanding of finance is important. Your input into financial decisions and understanding the nuances of such decisions will be extremely important to leading organizations through the transition to value-based care.
- *Manage conflict*: Leaders should be able to identify and manage conflict. Understanding how to gracefully and effectively deal with conflict resolution is a necessary skill during times of change and transition.

Healthcare leaders will inevitably have an impact on the lives of many people, as individuals rely on physicians and nurses during some of the most critical moments in their lives. It is imperative that, in todays healthcare environment, leadership roles will be crucial but preparing good leaders and envisioning their synergy with the vision of the organization is a bigger challenge for us to address.

Leadership at all levels has an all important role of encouraging and generating ideas for doing things in a better manner. This involves generation and spreading of ideas that form the foundation of newer ways of doing things.

Leadership in healthcare is a strategic activity that focuses on framing a shared vision through participation with all stakeholders. It helps in developing organizational structures and processes, in introducing and managing change initiative and in creating capabilities for maintaining and sustaining the quality culture. In nutshell, leadership is not something you do to people, It is something you do with people.

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RESEARCH ARTICLE

Hospital Information System Satisfaction in Brazil: Background and Moderating Effects

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ABSTRACT

In the last years, hospitals in Brazil have made significant investments in adopting and implementing new hospital information system (HIS). Whether these investments will prove beneficial for these organizations depends on the support that will be provided to ensure the effective use of the information systems (IS) implemented and also on the satisfaction of its users.

The purpose of this study is to propose a conceptual model, appropriate for the intention to use HIS, by adopting the system, service, and information qualities covered in the Information System Success Model proposed by DeLone and Mclean.

In the present study, structural analysis applied to data from a sample of 393 HIS users showed the variables service quality, information quality, system quality and satisfaction to act as antecedents of HIS success. A novel finding of the study was the importance of the user's aptitude with respect to computer moderating the relationships of the model.

Managerial implications are provided accordingly. Suggestions for introducing healthcare information system are then provided as well.

Keywords: Health information management, Management information system, Hospital, Brazil.

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INTRODUCTION

For many decades now, managers in the healthcare sector have tried to maximize the efficiency of hospitals without reducing the quality of healthcare provided to patients. In recent years, the problem has been exacerbated by insufficient public resources to meet an ever-increasing demand for healthcare service, which has in turn translated into a greater demand for information systems.[1]

Hospital information systems (HIS) have been defined as the sociotechnical subsystems of a hospital, comprising all information processing systems as well as the associated human or technical actors in their respective information-processing roles.[2] The HIS is designed to enable the execution of patient-care-related hospital functions, such as patient administration, hospital financial affairs, legal affairs, etc. Therefore, an HIS is an integrated information system that plays a key role in supporting hospital affairs through the use of appropriate hospital information technology.[3]

Hospitals, in Brazil, have received scant attention as healthcare organizations from either policy makers or researchers until recently.[4] Since the mid-1980s, the development of health policy in Brazil has focused on decentralizing service delivery, reducing financial disparities and achieving universal access to basic care. Issues of hospital performance, however defined, have been left mainly to the individual facility.[5]

Although, planning and control processes in Brazilian hospitals are accidental, involving more ad hoc actions and a profusion of goals,[6] the use of HIS is spreading more and more in public hospitals and, generally, in the healthcare sector in Brazil. The HIS of Brazil's Unified National System (SUS), the only one of its kind in Brazil with a national scope, is used to process payment for hospital admissions in public hospitals and private hospitals outsourced by the SUS, with the advantage of providing diagnostic, demographic and geographic information for each hospitalization.

It is widely accepted that the use of HIS offers huge development prospects and opportunities, mainly in improvements to the quality of patient care, increased staff efficiency and effectiveness and a significant decrease in their operational expenditure.[7]

Although individual studies have suggested a positive relationship between the level of IS investment and the productivity of healthcare services,[8] the overall results of IS investment profitability studies have been inconclusive.[9] Therefore, a rigorous evaluation of the HIS is recommended and the results of this could be of great importance for both the current decision makers and the future users.

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Many different methodologies have been developed for the evaluation of information systems, each one having its own unique characteristics. However, no one approach is considered as complete and generally applied for the evaluation of HIS.[10]

In the past, most researches on HIS were about the planning and discussion of hospitals as an entire unit[11] or about the brief introduction of healthcare information systems.[12] However, there are few studies analyzing HIS success from users point of view.[3,13]

The main purpose of this research is to determine whether an IS instrument that is commonly used as a surrogate measure for success, the Delone and McLean model,[14] can be applied in HIS and assessing the psychometric properties of a Brazil translation of the construct included in the D&M model. This study propose an evaluation model appropriate for HIS, in order to identify the cause and effect relationships between the relevant factors affecting HIS success and provide reference for hospitals to evaluate, improve and plan.

One of the principal novel contributions of the present study is its inclusion of users' aptitude for using computer as a variable that moderate the value-satisfaction relationship. In particular, the study tests for the first time whether aptitude which have been extensively analyzed in the literature[15-17] may influence the relationship between satisfaction and perceived quality.

The rest of the article is structured as follows. The following section discusses the IS success literature. The next section presents the hypotheses and the proposed model. Then the model's hypotheses are tested, followed by a discussion of the results and the principal implications for competitive strategies in the hospital sector.

Conceptual Framework

The role of IS in organizations has changed dramatically in the last decades, as have the key stakeholders and the expected benefits of the investments in IS. During this period, IS research has evolved to keep pace with the changing expectations regarding the success of IS.[18]

Many models were used to measure the success of different types of IS. However, we acknowledge that it is not easy to define the success of any IS since there are different stakeholders who assess IS success in an organization and each group assesses success from its perspective.[19]

In 1992, DeLone and McLean (D&M)[14] proposed a taxonomy of IS success consisting of six variables: System Quality, Information Quality, Use, User Satisfaction, Individual Impact and Organizational Impact. This model assumes that the quality of the system and the quality of the information, individually and/or in concert, affect the use and satisfaction of the user; it also considers that usage and user satisfaction are interdependent. It proposes that usage and user satisfaction affect the managers' individual behavior, which, in turn, affects the behavior of the organization, i.e. the organizational performance.[14]

Some authors[20] argue that it is necessary to include IS service quality in the D&M model, and assert that system, information and service quality together have an impact on IS use and user satisfaction. Referring to these argument[21] proposed a revision of the D&M model, by adding the dimension of service quality. Information, system and service quality may separately or simultaneously affect the two interrelated dimensions of IS use and user satisfaction while these two dimensions directly affect net benefits.

Previous studies[22] have conducted literature reviews to examine if the results of empirical studies supported the relationships posited by the original success model. These reviews revealed that some relationships in the model had consistently received support while others have received only mixed support (some found significant results while others did not).

Seddon and Kiew (2007)[23] modified the construct, use, because they conjectured that the underlying success construct that researchers have been trying to tap is usefulness not use. Seddon and Kiew's concept of usefulness is equivalent to the idea of perceived usefulness in TAM by Davis.[24] We agree with them that, for voluntary systems, use is an appropriate measure; however, if system use is mandatory, usefulness is a better measure of IS success than use.

The D&M IS success model was used by many studies to evaluate the success of various types of IS, such as web portals,[19] government to citizen (G2C) e-government systems,[25] e-commerce,[26] knowledge management,[27] etc.

However, there is little research on the use of D&M IS success model to assess IS hospital success in improving job performance and especially in developing countries. In the hospital sector, several theoretically based models of HIS success (with success defined from the user's perspective) provide empirical support that specific elements can predict successful systems.[7,28-32] In a recent study,[33] reviews the electronic health information system (EHIS) models, identifying 21 health and 5 nonhealth models.

Proposed Model and Hypothesis

Based on a review of the IS success literature, we propose a structural model that relates service quality, information quality and system quality with user satisfaction and perceived usefulness. In this model, service quality, information quality and system quality have both a direct effect on perceived usefulness and an indirect effect through satisfaction. We include one moderating variable of the

service quality and satisfaction relationship aptitude for technology use (Fig. 1). In the following paragraphs, we examine each of the variables included in the model, and the relationships between them.

Service Quality

Service quality is related to the quality of the support that system users receive from the IS department and IT support personnel. For example: responsiveness, accuracy, reliability, technical competence and empathy of the personnel staff.[34]

The seminal work on service quality is that of[35] which culminated in the development of the SERVQUAL scale. Cronin and Taylor (1992)[36] presented the SERVPERF instrument, which measures only customer perception of quality, as a sufficient measure of value. Although, there is a debate on the validity of SERVQUAL as a service quality measure,[34,37] Jiang et al (2002) found that SERVQUAL is indeed a satisfactory instrument for measuring IS service quality. In the present study, service quality was measured by 5 formative indicators: reliability, responsiveness, assurance, tangibles and empathy, adopted from Pitt, Watson and Kavan (1995).[20]

Several studies have examined the relationship between service quality, user satisfaction and usefulness[38-40] however, the findings of these studies suggest mixed support for this relationship, probably, because researchers have measured service quality using multiple methods.[34]

H1: Service quality positively influences user satisfaction with hospital IS.

H2: Service quality positively influences perceived usefulness of a hospital IS.

Information Quality

Information quality is concerned with the desirable characteristics of the system outputs, for example: relevance, understandability, accuracy, conciseness, completeness, understandability, currency, timeliness and usability.[18]

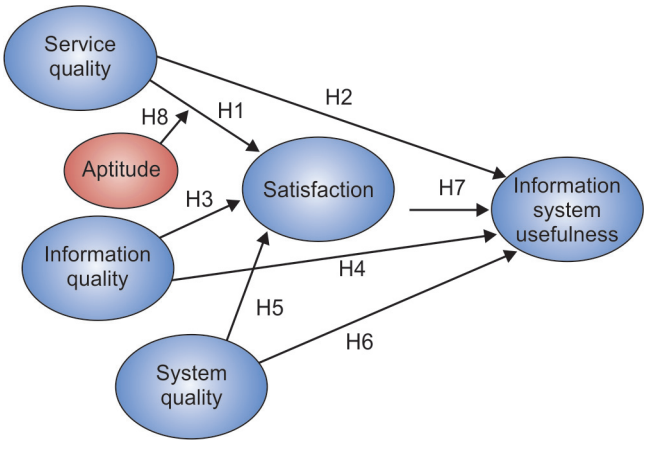

Fig. 1: General scheme of the investigation

Information quality measurement is problematic for IS success studies, indeed in several studies this dimension is not distinguished as a unique construct but is measured as a component of user satisfaction.[41] However, several authors have developed generic scale of information quality using the literature that is relevant to the type of information system under study.[42,43] Our construct is comparable to those used by previous researchers.

The relationship between information quality and user satisfaction is strongly supported in the literature.[27,44] Studies have found a consistent relationship between information quality and user satisfaction at the individual unit of analysis.[18]

Several studies have analyzed the relationship between information quality and usefulness, suggesting that higher information quality implies higher usefulness.[45,46]

Based on this, We hypothesized in this study that: H3 — information quality positively influences user satisfaction with hospital IS; *H4* — information quality positively influences perceived usefulness of a hospital IS.

System Quality

System quality is concerned with whether or not there are 'bugs' in the system, the consistency of the user interface, ease of use, response rates in interactive systems, documentation and sometimes, quality and maintainability of the program code.[23]

Many studies that measure system quality as perceived ease of use have found positive relationships with behavioral intentions to use the system.[47,48]

Based on the above, a positive relationship between system quality and perceived usefulness is hypothesized in this study.

H5: System quality positively influences perceived usefulness of a hospital IS.

At the individual level of analysis, there is also strong support for the relationship between 'system quality' and 'user satisfaction'.[44] System quality was found to be strongly related to user satisfaction.[27,49,50] Based on previous research that found a strong support for the positive relationship between 'system quality' and 'user satisfaction', it is assumed that higher system quality of hospital IS leads to higher user satisfaction in the context of this research.

H6: System quality positively influences user satisfaction with hospital IS.

Satisfaction and Usefulness

The most widely used user satisfaction instruments End-User Computing Support (EUCS)[51] and User Information

Satisfaction (UIS)[52] contain items related to system quality, information quality, and service quality, rather than only measuring overall user satisfaction with the system. Because of this, some researchers[23] have chosen use a semantic differential scale. These authors proposed the four-item instrument used in our study that attempts to measure user satisfaction directly.

Usefulness is the degree to which a person believes that using a particular system would enhance his or her job performance. Seddon and Kiew (2007)[23] suggest that there is a two-way causal relationship between usefulness and satisfaction derived from the relationship between use and satisfaction proposed in the D&M model. However, while user satisfaction has been widely used as a surrogate for systems performance and IS success, critics have questioned its general applicability because of poor instruments that have been developed to measure satisfaction.[53]

Following previous research[23,53] and considering that the Hospital IS use is mandatory and not voluntary, usefulness is a better measure of IS success than use. We measure this construct using the four item scale suggested by Seddon and Kiew (2007). Therefore, we hypothesize:

H7: User satisfaction positively influences hospital IS usefulness.

Aptitude for the Use of Computers

Aptitude for the use of computers refers to the set of knowledge and skills that enable individuals to function effectively with a computer. Scales to measure this concept have arisen in last decades such as the Computer Self Efficacy (CSE) scale[54] which was subsequently redesigned.[55-57] In the present study, we updated the 17-item CSE scale, eliminating some of the items that are no longer relevant in view of the technology advances in the in recent years. The result was a construct measured using 12 items.

We consider that the aptitude for the use of Internet can be a moderating variable of the relationship between service quality and satisfaction given that users with greater technology knowledge and skills might value more highly the quality of the service they receive, and will base their degree of satisfaction with the IS on this valuation. We hence posit the following hypothesis:

H8: A user's aptitude for computer moderates the relationship between service quality and satisfaction.

Object of Study and Sample

Data for our study were collected using a questionnaire survey administered in 5 university hospital in the Northeast region of Brazil during the year 2012. Since the purpose of our inquiry is to explore hospital information systems user satisfaction, we designed a survey to acquire information from those users. Before starting the study, we conducted a pretest consisting of interviews with hospital IS users and market research experts to ensure the relevance and clarity of the questionnaire. We obtained 393 correctly completed questionnaires. The technical specifications of the study are given in Table 1.

We assessed potential nonresponse bias by comparing the early *vs* late respondents. They were compared on several demographic characteristics. The t-test and chi-square analysis were used to examine the distributions between these two data sets. The results indicated that there are no statistically significant differences. This suggested that nonresponse bias was not a serious concern.

Data Analysis and Results

A structural equation analysis can be performed using two types of statistical techniques: methods based on the analysis of covariance (e.g. the analyses performed with the statistical program LISREL), and methods based on variance and its components (also known as partial least squares or PLS).

Following an analysis of the different methodological criteria distinguishing these two options, we chose to apply the PLS method using the program Smart PLS. The reasons were that this method is oriented at prediction, and allows one to easily incorporate formative latent variables, such as service quality.

The PLS technique is based on an combination of principal component analysis and regression analysis, with the main aim of explaining the variance of the constructs of the model.[58] Thus, the path coefficients and factor loadings of the items are estimated simultaneously in the context of the proposed model, thereby avoiding bias and inconsistency in the estimation of the parameters, allowing the interactions to be checked, and reducing the type II error.[59]

The measurement model was analyzed taking into account the reliability of the individual items and the discriminant validity of the constructs.[60] The item reliability of a reflective item was assessed by its factor loading onto the underlying construct. Hair et al[61] suggested that an item is significant if its factor loading is greater than 0.50. As shown in Table 2, the factor loadings of all reflective items in the measure ranged from 0.6 to 0.883. This exceeds

Table 1: Technical details of the study

Universe	43.873 Hospital IS users North-east region in Brazil
Geographical scope	Brazil
Data acquisition method	Survey
Sampling type	Stratified random sampling
Sample size	393 individuals
Fieldwork	January 2012

the threshold set by (Hair et al, 2009) and demonstrates convergent validity at the item level.

The reliability of the constructs was determined by analyzing the composite reliability.[62] One observes in Table 2 that the constructs were found to be reliable since the composite reliability exceeded 0.8.[63] Moreover, the values of the average variance extracted (AVE) were greater than 0.5, indicating the convergent validity of the model.[62]

A construct has discriminant validity if its AVE is greater than the square of the correlations of this construct with the others.[62] One observes in Table 3 that this criterion is satisfied for the discriminant validity of our model.

Figure 2 shows the results of the estimation of the structural model. The arrows indicate the causal order, the number beside each arrow is the corresponding standardized path coefficient, and in parentheses is the product of the standardized path coefficient and the correlation coefficient between the two constructs expressed as a percentage.[64] A bootstrap resampling technique, considering 500 subsamples, was used to determine the values of the t-test, and thus verify the significance of the causal order relationships.

Table 2: Evaluation of the measurement model

Construct	*Factor loading/ weights*	*Cronbach´s Alpha*	*Composite reliability (Pc)*	*AVE*
Service quality		N/A	N/A	N/A
SQ2	0.374			
SQ3	0.347			
SQ4	0.627			
Information quality		0.752	0.827	0.446
IQ1	0.740			
IQ2	0.619			
IQ3	0.633			
IQ4	0.734			
IQ5	0.668			
IQ6	0.600			
System quality		0.828	0.880	0.596
SQ1	0.809			
SQ2	0.656			
SQ3	0.789			
SQ4	0.814			
SQ5	0.780			
User satisfaction		0.863	0.907	0.708
Sat1	0.867			
Sat2	0.867			
Sat3	0.834			
Sat4	0.797			
Perceived usefulness		0.893	0.919	0.656
Use1	0.679			
Use2	0.883			
Use3	0.877			
Use4	0.834			
Use5	0.803			
Use6	0.764			

The figure also shows the values of the Stone-Geisser Q^2 test of predictive relevance. That they are all positive guarantees the predictive relevance of the model. Satisfaction is the latent variable that most contributes to explaining IS Perceived Usefulness, followed by the variables information quality and service quality. Overall, 47.2% of the variance of the variable Perceived Usefulness is explained by the other latent variables in the model. Satisfaction is explained principally by information quality, but is also significantly related to the variable system quality, confirming the first seven hypotheses of the model.

Moderating Effect of the Aptitude

The moderating effect of the aptitude with respect to technology were tested following the multi-group analysis procedure suggested by Chain (2000),[65] which has been used by various authors.[66,67] In this procedure, a Student's t-test is calculated using Equation 1. This equation is derived from a Student's t distribution with m + n – 2° of freedom, where Sp (Equation 2) is a pooled estimator for the variance of the standard errors, m and n are the sample sizes of each group (in this case 2), and SE is the standard error of each path coefficient of the structural model for each group. In the present case, the two groups were selected previously using a k-means cluster analysis (k = 2).

Equation 1: $$t = \frac{\beta_a - \beta_b}{S_p \sqrt{\frac{1}{m} + \frac{1}{m}}}$$

Equation 2: $$S_p = \sqrt{\frac{(m-1)^2}{m+n-2} SE_a^2 + \frac{(n-1)^2}{m+n-2} SE_b^2}$$

The test results (Table 4) showed that the differences between the two groups are significant for the variable aptitude, thus confirming the initial hypothesis (H8).

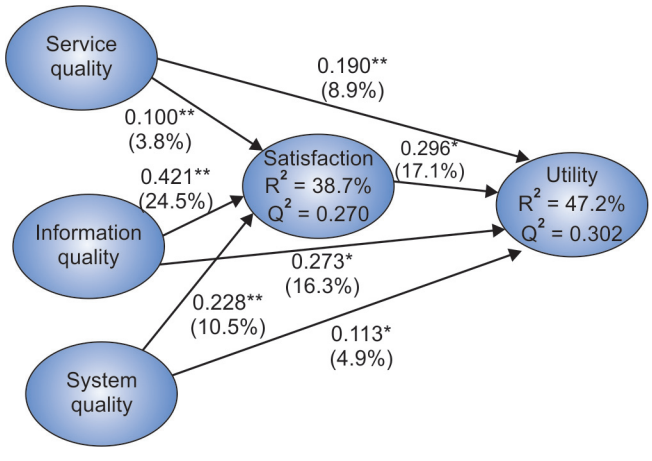

Fig. 2: Results of the structural model

Table 3: Discriminant validity

Construct	*Service quality*	*Information quality*	*System quality*	*Satisfaction*	*Perceived usefulness*
Service quality	NA				
Information quality	0.503	0.668			
System quality	0.278	0.485	0.702		
Satisfaction	0.375	0.582	0.460	0.842	
Perceived usefulness	0.470	0.596	0.434	0.578	0.810

Note: The diagonal elements are the square root of the AVE

Table 4: Moderating effect of the variable aptitude with respect to technology on the relationship between service quality and satisfaction

	Sp	*βa-βb*	*T*	*Hypothesis*
Aptitude (H8)	0.0639	0.220	33.831	Confirmed

Therefore, in the present case, the variable aptitude mode rates the relationship between service quality and satisfaction.

Conclusions and Implications

This study was conducted to empirically investigate issues that might be related to the key determinants of HIS success, to extend the generalizability of the D and M model by assessing the psychometric properties of a Brazil translation of the model and, finally, to provide additional insights into end-user satisfaction and usefulness by considering aptitude as moderator in the service quality-satisfaction relationship.

The findings indicate that the D and M model proposed is a valid and reliable instrument that can be used confidently by researchers in Brazil and elsewhere. However, a better understanding of the factors that can influence user satisfaction and HIS success needs to be developed in order for HIS applications to be used effectively. This study advances previous research by testing the moderator effect of attitude in the service quality-satisfaction relationship.

It represents the first comprehensive examination of D and M model in Brazil using multiple informant responses from end-users of HIS applications. Consistent with findings from several previous studies, the D and M model has been shown to be a valid predictor of IS success. Although the psychometric properties of the model appear to be robust across studies, continuing efforts should be made to validate and extend the proposed model.

Our study shows that the D and M model may be used to evaluate hospital information systems. The model provides not only an overall assessment of end-user satisfaction and usefulness but also the capability to identify the most problematic aspects of HIS implementation efforts. The magnitude of path coefficients provides useful insights into the relative importance of each subscale of the D and M model and, thus, the major areas of satisfaction or dissatisfaction with the use of a given HIS. Managers could focus on these factors as significant contributors to overall satisfaction to improve HIS system effectiveness.

The study proves that service quality of the HIS positively influences users' perceived usefulness, supporting H2. In addition, service quality also has a positive influence on users' satisfaction, supporting H1. When users feel more satisfied with the service quality of the HIS, their satisfaction and perceived usefulness will be higher. Therefore, hospitals should not only focus on these influential forces during the system introduction period, but also continuously improve their service qualities. All of these affect users' feelings about the information system. By continuously enhancing its service qualities, the system would be able to reach its potential full performance.

Further, information quality directly and indirectly positively affects IS success (H3 and H4), thus indicating that an increase in the quality of the information leads to an increase in user satisfaction and IS usefulness. The result is in line with previous studies. When the user's attitude toward the information quality is more positive, the perceived usefulness of information will be higher. As a result, this study asserts that while introducing HIS, we should emphasize the following aspects: making sufficient information available, having good interface design and ensuring on-time updating of information on the system.

System quality directly and indirectly contributes significantly to the observed explanatory power of HIS success (H5 and H6), thus implying that an increase in the quality of the system leads to an increase in HIS success. System quality incorporates system ease of use, speed, documentation, user interface and training. Thus, a net positive effect from these factors will result in a positive effect on HIS success.

The results also underline the need to design highly effective user documentation and provide additional and continuing training to end-users. Creating a supportive environment responsive to end-user concerns and needs, and working collaboratively with end-users in utilizing new software applications, can yield long-term benefits and increase the system's use and effectiveness. Technical difficulties, such as bugs in the software, problems interfacing with existing systems, system speed and hardware difficulties, can lead to increased user frustration and lower user

satisfaction. End-user computing satisfaction may be used to signal to management such mismatches and difficulties.

Although this study makes significant contributions to both academia and practice, there are several limitations which open up venues for further research. Firstly, its sample size is rather small, since only a particular subject group, the hospital personnel of 5 hospitals in Brazil who interact directly with the HIS, was targeted. In addition, only Brazilian University Hospitals were selected as samples to develop and test the proposed model. Future studies should further develop the proposed model and verify the proposed model with broader samples, such as medical centers, private hospitals and clinics.

Secondly, there are several factors not discussed that may influence the constructs in the proposed model. For example, speed of response may influence service quality, perceived ease of use may influence satisfaction, etc.

In addition, our research results can help planners and managers understand key considerations affecting HIS development and use, and may be used as a reference for system design, development and implementation. Although this study clearly demonstrates the antecedent role of service quality, information quality and system quality, it is important to identify additional variables that can improve our ability to more accurately predict HIS success by incorporating various perspectives from multidisciplinary personnel.

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APPENDIX

Service Quality
HIS is easy to use.
HIS is user friendly.
Compared to other computer software, HIS is easy to learn.
I find it easy to get HIS to do what I want it to do.
It is easy for me to become skilful at using HIS.
Information Quality
HIS provide sufficient information
HIS provide the precise information you need
HIS provide accurate information
HIS provide up-to-date information
HIS provide reports in a useful format
HIS provide clear information
System Quality
HIS employees give prompt service to users
HIS has users' best interests at heart
HIS has up-to-date hardware and software
HIS is dependable
HIS employees have the knowledge to do their job well
User Satisfaction
HIS meets adequately my information processing needs
HIS is efficient
HIS is effective
Overall, I am satisfied with HIS
Perceived Usefulness
Using HIS in my job enables me to accomplish my tasks more quickly.
Using HIS improves my job performance.
Using HIS in my job increases my productivity.
Using HIS makes it easier to do my job.
Overall, I find HIS useful to my job.
Aptitude for Using Computer
I feel that I have a special talent using computers.
I could solve any problem with a computer.
I know what to do when a new situation appear in my computer.
I feel that I am quite capable to use any word processor
I am afraid of make a mistake when using my computer
I feel that I am quite capable of creating a Web page.
I feel that I am quite capable of downloading files from another computer.
I feel that I am quite capable of making a purchase on the Internet.
I feel that I am quite capable of interacting in a social network.
I feel that I am quite capable of filing my tax return or doing some legal paperwork with a Government Administration over the Internet.
I feel that I am quite capable of finding information on the World Wide Web.
I feel that I am quite capable of changing the configuration of my operation system.

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RESEARCH ARTICLE

Study of Unit Cost of Medical Intensive Care Unit at Tertiary Care Hospital in Government Set up in New Delhi

[1]AK Gadpayle, [2]HK Dangi, [3]Debopriya

ABSTRACT

Aim: The cost incurred on delivery of Medical Intensive Care Service to the patient varies from type of Intensive Care Unit (ICU). The present study was conducted to assess the cost of per patient per day in Medical Intensive Care Unit (MICU).

Materials and methods: It was a prospective study which was carried out at tertiary care hospital, in Government setup, Delhi from 01st January 2014 to 31st January 2014. All the Adult patients admitted in Medical ICU were taken for study. Various costs like fixed, variable, Direct and Indirect were calculate for the study period by step down approach. The unit cost was calculated.

Results: Total 32 patients were admitted in Medical ICU during the study period. The average days of admissions calculated to 171 days. The average length of stay was estimated at 5.343. The salary component amounts to 42.44% of the total cost. The equipment cost amounts to 37.00% of the total cost. The total fixed cost amounts to 81.62% and variable cost amounts to 18.38%. Out of variable cost the investigation radiology amounts to 6.35% followed by medicine 4.81% and Investigation 3.83%. The unit cost calculated amounts to ₹ 1133.29.

Conclusion: The fixed cost is a major share of the total cost incurred in Medical ICU. Out of which equipment cost stands first. The unit cost amounts to ₹ 1133.29 which is relatively less than the other studies probably due to close type of ICU and patients admitted in Medical ICU are coming from outside.

Keywords: Medical ICU, Unit cost, Tertiary care hospital.

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INTRODUCTION

India is a very diverse country having geographical, political, linguistic predominance. The health need defer from region to region and as such healthcare delivery with facilities as per requirement of the people. Various cost studies are being conducted in India for different levels of healthcare services and providers. They may be specific to a particular disease (e.g. typhoid) or based on a specialty (e.g. pediatric care) or service provider (e.g. primary health center). Anand et al (1993)[1] estimated the cost incurred by a primary health care center in Northern India during 1991-92, Krishnan et al (2005)[2] tried to estimate the cost of outpatient and inpatient pediatric health services provided by the All India Institute of Medical Sciences. Treatment cost of typhoid fever at two hospitals in Kolkata was estimated by Sur et al (2009).[3] Mathur et al (2010)[4] had determined the unit cost of curative care provided at primary healthcare centers in Ahmadabad. The ICU patients across the country show peculiar and distinct trends. During monsoon, 70 to 80% of patients are of infectious diseases (tropical febrile emergencies, e.g. malaria, leptospirosis, dengue). Lifestyle related metabolic diseases and consequent critical situations are on the rise, e.g. diabetes, cirrhosis, uremia. Consistent with the general demographic trends, 30 to 40% of patients in ICU are elderly, with inherent features of difficult weaning, prolonged stay and refractoriness to standard line of treatment. Nosocomial infections due to multiple vascular accesses and tubings, catheterizations are clinical entities of concern, as are fungal infections in immune compromised hosts, such as those with HIV/AIDS, uncontrolled diabetes mellitus further accentuated by usage of potent antimicrobials.

This is not surprising as critical care medicine is relatively a new field though it has evolved significantly over the past decade. In order to understand the cost, it is important to understand the current organization of critical care services in India and its inherent diversity.[5] There are only very few studies looking into cost of intensive care in India, hence this study is carried out.

MATERIALS AND METHODS

It is prospective study. All sick patients admitted in Medical Intensive Care Unit (MICU) for the month of January 2014

at Government Tertiary Care Hospital, New Delhi, were included in the study.

The cost of eight bedded Medical Intensive Care Unit (MICU) for 1 month (31 days of January) is calculated by step down method of costing taking into consideration of fixed cost (direct and indirect) and variable cost (direct and indirect). The numbers of patients admitted were counted and total days of admission were ascertained. The average length of stay was also calculated. The unit cost was calculated later on as per standard formula of cost per patient per day.

Fixed cost is of two types direct and indirect. The Variable cost also consists of two components, i.e. direct and indirect. fixed direct cost included the salary of Staff, Equipment cost with depreciation, building maintenance cost. Respective maintenance cost was obtained from equipment maintenance department as per Annual Maintenance Charges norms and then computed for monthly basis for the said study period. Building depreciation and maintenance of the premises were arrived at by guidelines for valuation of immovable properties by A Chattopadhyaya; Chief Engineer Valuation Income Tax Department, New Delhi, 1996.

Fixed Indirect cost included Electricity consumption (was arrived at by taking note of type and number of fixture, equipment's and its consumption of electricity by individual patient and collective use by the premises in watts counted. Total consumption was arrived at and cost assessed by applying the charges @ ₹ 5.50 per unit.), Water consumption (500 liters per patient per day as per standard WHO guidelines and prevalent charges (₹ 10 per KL) as applicable were applied), Running cost of closed circuit TV (CCTV) was calculated by adding the cost of installation, its depreciation, AMC charges, and the salary of human resource required to run it. The cost per bed was calculated and then multiplied by the MICU capacity, i.e. 8 in number). Furniture maintenance (done on apportionment method), telephone and internet cost (was computed by apportionment method by dividing the monthly bill of telephone and internet by the number of beds and then computing for eight bedded MICU) and Generator cost for 8 bedded MICU.

The Variable Direct cost included Cost of Medicines, (rates of all pharmaceutical agents used in the MICU were obtained from the purchase department of the hospital and its individual consumption was assessed and costing per month is calculated). Cost of consumables (was compiled as per three monthly consumption, on which basis monthly consumption determined and its costing assessed), Central Sterile Supply Department (CSSD) (costing was done by compiling the equipment price and its depreciation, calculating the equipment maintenance, salary of human resources. divided by total no. of items sterilized in 1 month and multiplied by no. of items supplied in MICU), cost of lab services (Government approved rate/ CGHS rates were applied for cost assessment for each lab/procedure/ surgery / radiology services on individual basis and costing arrived at on monthly basis) and radiological cost was calculated (the similar methodology of lab services was applied).Oxygen cost (only the running cost of oxygen therapy was calculated on the monthly consumption pattern of liquid oxygen, supply of oxygen cylinders in the manifold, running cost of plant, its maintenance cost, salary of technicians). Variable indirect cost included cost of stationery, pest control services. The Stationery cost was calculated on monthly consumption. Pest control services was calculated by the method of apportionment. Totaling of each cost was done and unit cost is calculated.

EXCLUSIONS

1. The land rates were not included in for paucity of data.
2. Data on laundry, waste disposal, blood product was not available hence excluded.
3. Dietetic services were not included as majority of Patients were on Ryle's Tube feeds/ IV fluids and very few were given normal feed short duration.

RESULTS

This study was conducted in 8 bedded Tertiary Care Government Hospital in New Delhi in the month of January 2014. The data incorporated 'fixed direct cost', e.g. salary of the staff including medical, nonmedical as well as supporting staff, equipment procurement as well as maintenance cost, building depreciation and maintenance costs and 'Fixed Indirect costs', e.g. generator backup, water and electricity charges, provision of telephone and internet, installation of CCTVs as well as furniture maintenance. 'Variable Direct cost', e.g. like investigations, medicine, radiology, consumables, oxygen, and 'variable indirect cost', e.g. stationery, pest control cost, etc. were calculated.

Costs incurred for MICU services in 1 month under various heads were calculated and analysis was carried out.

Fixed Cost

The total fixed cost was calculated as 81.62%. The Direct fixed cost was calculated as 79.44%. Out of direct fixed cost salary component has major share (42.44%) and equipment component was amounting to 37.00%. Only 2.18% cost was shared by other services like charges of electricity, equipment and building maintenance, etc. (Table 1).

Cost of Salary

It was observed that the salary component accounts to 42.44% of total cost of MICU, during the study month. Out of which 21.31% belongs to doctor's salary which included

both faculty and resident doctors. The salary of the faculty amounts to 8.87% and resident doctors to 12.44%. The salary of the nursing personnel calculated was 15.39%. The cost of supervisory component of nursing personnel amounts to 9.17% of the cost of salary of nurses. The salary of ECG technicians takes the share of 2.68% of the total cost (Table 2).

Cost of Equipment

Various life saving equipment were used in the MICU, like ventilator, defibrillator, monitors, bipap, ultrasound, X-ray, ECG, infusion pumps, etc. The total cost of equipment amounts to 37.00%. Out of this, cost ventilator consume 11.13%, central station monitor 8.95%, and X-ray amount to 6.90%. Monitors 2.18%, defibrillators 2.90% 2D Echo 1.94% respectively (Table 3).

Variable Cost

The total variable cost calculated was found to be 18.38%. The direct variable cost amount to 18.31% and indirect variable cost amounts to 0.07%. Out of variable direct cost radiological investigation amounts to 6.35%. This is followed by medicine (4.81%) and lab investigation (3.83%). The indirect variable cost is least (Table 4).

Table 1: Distribution of cost

Head	*Total salary cost per month*
Salary	2631400
Equipment	2293875
Equipment maintenance	51525
Building maintenance	83669.25
Diagnostic	929330
Others	209939
Total cost per month	6199738.25

Table 2: Distribution of salary component of cost

Staff	*Total salary*
Doctor (faculty)	550000
Doctor (nonfaculty)	771000
Nurses	954000
Nursing orderly	132000
Safaiwala	28000
Guard	14000
ECG tech	166000
Data entry operator	16400
Total salary	2631400

Table 3: Distribution of cost equipment

Name of equipment	*Per month equipment cost*	*Percentage*
Ventilator	690000	11.13
Monitors	135000	2.18
Central station	555000	8.95
Defibrillator	180000	2.90
USG	57000	0.92
2D Echo	120000	1.94
X-ray	427500	6.90
Infusion pump	117000	1.89
ECG	12375	0.20
Total cost	2293875	

Unit Cost

The unit cost in Medical ICU is calculated by formula depicted below. It was observed ₹ 1132.99 in the present study.

Total cost per month/no. of admission days/no. of patients admitted = unit cost per patient per day 6199738.25/171*32 = 1132.99.

Patients Characteristics

Total 32 patients were admitted during the month of January 2014. The maximum no of patients were suffering from cardiovascular disorder mainly coronary artery disease (CAD) (10), followed by neurology, i.e. cerebrovascular accident (CVA). Only two patients were admitted with urinary tract infection with sepsis (Table 5).

Duration of Stay of Patient

It was observed that out of 32 patient's maximum no. of patients stayed in MICU for 1 to 5 days.[12] Only eight patients spent 0 to 1 day in hospital. Rest of the patients stays 5 days and above (Table 6).

Average Length of Stay (ALOS)

The total admission days calculated on individual patient's admission date and time and discharge date and time. The total days of individual patient calculated like this and sum of all 32 patients done. This arrived sum is called as a total admission days. The total admission days calculated were 171. This sum (171) was divided by total no. of patients (32).

Table 4: Distribution of variable cost

Total variable cost	*Percentage*
Medicine	4.81
Investigation (lab)	3.83
Radiology	6.35
CSSD	0.24
Consumable	2.7
Oxygen	0.39
Stationary	0.06
Pest control	0.01

Table 5: Distribution of patient accordingly disease

Type of patient admitted in a month	
CVS	10
RS	4
Abdomen	4
Neurology	8
UTI	2
Diabetic	4

Table 6: Status of patient according to duration in MICU

Days	*Duration or stay (days) of patient*
0-1	8
1-5	12
5-10	6
10 onward	6
Total	32

The result is taken as average length of stay. In the present study, average length of stay was (171/32) 5.343 days.

DISCUSSION

The study was conducted in 8 bedded MICU of Government Tertiary Care Hospital, New Delhi. This was a closed ICU. The unit cost was assessed and found to be ₹ 1132.99 which appears to be lower in the present scenario. The various studies conducted in India in this matter. Sumitra Chatterjee[7] had observed in her study that cost per patient in tertiary care government hospital ₹ 614. She also opined that major component of hospital cost is human resources which is true for this study as it consume 42.44% of total cost. Parikh et al in their study showed cost per patient per day was ₹ 1,973. It is also opined that average length of stay less than 7 days reduces the cost per unit, in present study the average length of stay is 5.343 days.

The cost of ICU care in a tertiary care center in India by Udhwdia (in 1991)[8] was reported to be ₹ 3200 per patient ($167.70). Staffing, intravenous fluids, and drugs accounted for 75% of the cost of ICU care, whereas 15% accounted for laboratory investigations and 6.9% for disposables. The cost of ICU care is rising steadily owing to costly equipment and manpower in better ratios. Dasta et al (2005)[9] have studied daily cost of intensive unit and observed that mean intensive care unit cost and length of stay were 31,574 ± 42,570 dollars and 14.4 days ± 15.8 for patients requiring mechanical ventilation and 12,931 ± 20,569 dollars and 8.5 days ± 10.5 for those not requiring mechanical ventilation. Daily costs were greatest on intensive care unit day 1 (mechanical ventilation, 10,794 dollars; no mechanical ventilation, 6,667 dollars), decreased on day 2 (mechanical ventilation, 4,96 dollars; no mechanical ventilation, 3,496 dollars), and became stable after day 3 (mechanical ventilation, 3,968 dollars; no mechanical ventilation, 3,184 dollars). Adjusting for patient and hospital characteristics, the mean incremental cost of mechanical ventilation in intensive care unit patients was 1,522 dollars per day ($p < 0.001$). In the present study, the average length of stay is 5.343 which support the reduction of cost as the stay increases.

Shweta et al (2013)[10] have studied the total cost per day in Renal ICU. It was observed that total cost per day was Indian rupees (INR) 10,364 (US $ 222). Hospital has borne 46.4% of the total cost and rest by patients. The mean cost represented 36.8% of the total cost and 69.8% of the variable cost. Expenditure on personnel salary constituted 37% of the total costs and 86% of the fixed cost. Length of stay in RICU was significantly higher in no survivors (14.73 ± 13.6 days) *vs* survivors (8.3 ± 7.8 days) ($p < 0.05$). The TISS-28 score points in survivors was 30.6 *vs* no survivors 69.2 per nurse ($p < 0.05$) correlating strongly with the total cost ($r = 0.91$). The finding in this study do not match with the study of Shweta because in this study cost is low (₹ 1133) and average length of stay is less (5.343 days). The expenditure on salary is nearly matching which is (42.44%) as compare to 36.8%.

There is increasing evidence that closed[11] or transitional models[12] has better outcome and resource utilization, than open ICUs, Though ISCCM[13] endorses closed model in general medical-surgical as well as specialty ICUs, Due to closed ICU the unit cost is on lower side. Salaries of other supportive staffs like Technician, ward Boyd, Attendants, Guards are also counted Comparative figures in West quotes a high percentage (about 50%) of the total costs of ICU that can be attributed to this cost block which is a clear reflection of the labor-intensive requirements within critical care as well as high level of remuneration for both medical and nursing staff.[14] On the contrary, Parikh and Karnad[15] reported low staff wages as one of the reasons for low cost of ICU care in India. Despite the growth in this field, this trend continues to persist. On the flip side, high level of attrition and migration to western countries creates an ongoing shortage and demand for support staff, which in turn affects quality of care and hence possibly costs. Parikh and Karnad[15] attributed the high 64.2 TISS points toward the increased workload per nurse due to these reasons various studies carried out at AIIMS showed beyond doubt that it shares major portion of financial resources. Even then from a practical perspective this cost block is unlikely to add toward total ICU costs substantially in India.

The low cost of ICU care in India is partly because of low cost of drugs and recycling of consumables. Though the later still holds true in some Institutes, the costs of drugs have increased enormously. In a study of factors affecting drug use, cost of therapy, association between pattern of drug use and survival in a tertiary care ICU, it was found that although the mean number of drugs in prescription increases at the time of admission till the time of discharge. On the other hand, inappropriate use of antimicrobials especially in the ICU context[16] and the increasing incidence of microbial resistance even to newer generation of antibiotics reported from various ICUs across the country[17] pose greater concern. Considering the fact that the cost of using an antibiotic, such as Meropenem is ₹ 3,000 per day, negative trends like this will add to the overall ICU costs substantially.

The observations made in the present study are supported by the various studies in the past. Though this is true, it

has limitations like not taking land cost, dietary, laundry, procedural cost while calculating the cost per unit hence exact cost is not really assessed. The study duration is only 1 month which is not sufficient to say authoritively on this matter. It is suggested that prospective study for long duration having consideration of all factors responsible for cost measurement may be undertaken to know the real cost.

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RESEARCH ARTICLE

A Cost Analysis Study of Inpatient Care Services at a Large Tertiary Care Teaching Institute at New Delhi, India

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ABSTRACT

A study was carried out at a large tertiary care teaching institute at Delhi to estimate the cost of medicines and surgical consumables to the hospital and the out of cost to in-patients, during the course of their stay at the hospital.

The study was conducted in the year 2007 and a total of 174 cases were included in the study fulfilling the selection criteria. The total length of stay of all the patients under study was 2235 days.

Total average cost incurred on patient care in the indoor unit under study thus calculated came out to be ₹ 1861.31 per bed per day.

The final average figure arrived at for cost to the hospital/bed/day in this study is ₹ 834.74 and cost to the patient/day came to ₹ 1026.57 on account of the Medicines, Surgical consumables and Crystalloids.

The maximum total cost toward patient care came to ₹ 10958.84 for ICU. Whereas the lowest cost of ₹ 175.46 was for the psychiatry.

This study helped us to know that how much it costs in terms of cost per bed per day to treat in-patients in selected specialties and in a general ICU as well.

Keywords: Costing, Inpatients, Cost per bed per day, Cost to hospital, Cost to patient.

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INTRODUCTION

The advent of technology in medicine has been accompanied with quality consciousness and cost consciousness. Hospital management has a responsibility toward the community to provide healthcare services that the community needs of an acceptable level and of quality at the least possible price.

A study by price Waterhouse Cooper has shown that in the US, the average cost of healthcare has increased by 13.7% in the year 2001.[1] Increase in the need despite the increased cost of healthcare, has at the same time not witnessed the funding to go up proportionately.

India being one of the developing countries of the world, the main health concern is the utilization of resources on a rational basis. The hospitals consume about 80% of total health budget.[2] It is also a known fact that out of the recurring expenditure in the hospitals, the materials consume about 30 to 40% of total budget.[3]

WHO too has addressed the issue of financing the health care delivery system with main objective of considering alternative ways in assuring health for all. It said that costing exercises could be an important tool for estimation and projection of budgetary demands. They concluded that there was lack of information on these aspects in developing countries and stressed the need for strengthening the research capability in this area.[4]

The aim of the study was to do a 'A Cost Analysis Study of Inpatient Care Services at a Large Tertiary Care Teaching Institute at New Delhi, India'. And the objectives were:

1. To identify the major cost centers, under material and supply budget, in different representative indoor units of the study setting.
2. To determine the cost per bed per day, incurred by the hospital at present, with available current Material and supply budgetary allocation in providing in-patient care services.
3. To determine expenses incurred by patients on medical and surgical items during hospital stay per day.

Methodology

An observational study for 15 days was carried out to understand the study areas and to understand the working. It helped in gaining familiarity with the study area and to established a rapport with the staff working in the area, as well.

Representative Indoor units of a Large Tertiary Care Teaching Institute were identified for this descriptive Observational study, for which Ethical clearance was obtained from the Ethics Committee of the Institute.

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Indoor units were stratified for the study as follows:

- Medical disciplines
- Surgical disciplines
- ICU

Out of these, following representative indoor units were selected:

- Medical disciplines
  - Medicine
  - Pediatrics
  - Dermatology
  - Psychiatry
- Surgical disciplines
  - Surgery
  - Orthopedics
  - Obstetrics and Gynecology
- ICU

Sample Size

It was decided that for the study the sample size should be 15% of the total bed strength of the hospital.

The bed strength of the hospital was as follows:

- General beds: 807
- ICU beds: 54 Total = 861

Thus, the sample size came to:

- General beds: 121
- ICU beds: 8 Total = 129

No. of beds included in the study from different identified indoor units were drawn in Table 1.

Bed nos. were choosen from indoor units applying the principle of:

- Stratified random sampling method—for stratifying indoor units
- Random sampling method—for choosing the bed nos.

All the patients admitted on the identified beds in the indoor unit during study period were included in the study.

Cases admitted during the study period but discharged even after the study period were also included.

But cases admitted on the selected beds, before study period and continuing through the study duration were not included.

Calculation of the cost: a total of 174 (161 + 13) cases were included in the study fulfilling the selection criteria.

Table 1: Specialty wise break-up of beds drawn as sample

Sl. no.	*Department*	*No. of bed*
1	Medicine	24
2	Obstetrics and gynecology	26
3	Surgery	24
4	Pediatrics	18
5	Orthopedics	12
6	Dermatology	9
7	Psychiatry	8
8	ICU	8
Total		129

Cost incurred by Hospital and patient on Medicine, Surgical consumables and Crystalloids were calculated based on the standards enunciated by the TCS Study[5]:

Cost to the Hospital[5]

The detail record of consumables were obtained from ward record held with sister-in-charges for the said study duration. For this, study items being used in the IPD (wards) under the head of medical, surgical and crystalloid stores only, were taken into account to calculate the cost to the hospital on consumables in direct in-patient care during their stay.

In a ward there are two types of consumables:

1. One which can be directly accounted per patient, e.g. medicines.
2. There are certain common use items which can not be calculated patient wise, e.g. cotton.

Keeping in mind this pattern of use it was decided that the total items under study be calculated as below to arrive at the cost per bed per day.

The total items and their quantity consumed in a particular study ward during the study duration was compiled from records obtained as mentioned above.

It was decided to prepare a list of all the consumables (medical, surgical and crystalloids), based on the Ward Record [LIST: A: Specialty Wise Record of Consumables] for that duration, to calculate the total cost of consumables used in that indoor unit/specialty. Thus, total monthly consumption record was made.

Based on the unit price as per the approved rate list for the said duration available with stores office, as per the rate contract of approved items, total cost was calculated. Total no. of beds in that specialty was multiplied by the bed occupancy rate to ascertain the beds on which the items would have been consumed. Then cost to the hospital per bed per day was calculated, by simple arithmetic calculation for those items, ward/specialty wise, for the study duration.

Cost to the Patient

Case record/case sheets of all the cases fulfilling above mentioned criteria were. Following steps were followed to calculate the cost to the patient:

- Based on the nurses daily record in the case sheets, Patient specific consumption record was created = list B
- Out of this, items purchased by the patient were identified and separated by comparing the lists A with B

For all the patients under study (department wise), their case sheets were studied in great detail to make out clearly the items which were not present in the consumption list of that ward (prepared as mentioned in the preceding step). The items (medical / surgical) which were not mentioned in the ward record, but were mentioned in the Case Sheets (Nurses Daily Record and Input/output Chart), were presumed to have been purchased by the patients.

Table 2: Average length of stay: specialty wise

Sl. no.	*Specialty/areas*	*Total no. of study beds*	*Study bed as % of total bed*	**No. of patient on study beds*	**Total no. of days*	*Average length of stay in days*
1	Dermatology	9	27.58%	6	194	32.33
2	Psychiatry	8	30%	7	177	25.28
3	Orthopedics	12	28.57%	18	387	21.5
4	Medicine	24	26.66%	18	257	14.27
5	Pediatrics	18	30.58%	33	362	10.96
6	Surgery	24	28.12%	42	421	10.02
7	Obs and Gyne	26	30.37%	37	370	10
8	ICU	8	14.81%	13	67	5.15

*No. of patients admitted on these beds during observation period and included as per inclusion criteria; **Total no. of days of hospital stay of all patients; who were included in the study

Table 3: Cost to hospital

Sl. no.	*Name of the specialty*	*Cost to hospital per bed per day*
1	ICU	3700.39
2	Medicine	1124.14
3	Pediatrics	718.22
4	Surgery	357.01
5	Orthopedics	323.11
6	Dermatology	173.43
7	Psychiatry	143.91
8	Obs and Gyne	137.68

Table 4: Cost to patient

Sl. no.	*Name of the specialty*	*Cost to per patient per day in ₹*
1	Medicine	160.81
2	Surgery	136.86
3	Orthopedics	270.03
4	Obs and Gyne	76.64
5	Pediatrics	54.35
6	Psychiatry	31.54
7	Dermatology	223.91
8	ICU	7258.45

1. The items were thus identified and quantified. Cost incurred by the patient on medical and surgical items was calculated considering the prevailing MRP.
2. Expenses incurred by all the patients in the specialty were added = [C] Specialty wise — Out of pocket expenses.
3. Total no. of indoor days of all the patients under study were added = [D].
4. Then expense incurred by the patients per bed per day, specialty wise, was derived as below:
   For example, C/D

All the cost thus obtained as of now were calculated department wise. These were then added up to calculate total cost per bed per day (both the cost to hospital and cost to the patient) on consumables for direct inpatient care. The data thus obtained was reflective of the total cost of inpatient care services at the hospital across the departments.

Overall Cost

Overall cost was derived by adding the cost to the hospital and cost to the patient. Thus, cost on account of medicines, Surgical consumables and Crystalloids was calculated under following heads:

a. Cost to the hospital per bed per day
b. Cost to the patient per bed per day
c. Total cost per bed per day (for the representative indoor units of the hospital).

OBSERVATIONS AND DISCUSSION

Some Incidental Observations

A total of 174 cases were included in the study fulfilling the selection criteria. The total length of stay of all the patients under study was 2235 days. Specialty wise distribution of beds and cases included in the study and ALS as observed for the different specialty/area under study are shown in Table 2.

Calculation of Cost to Hospital per Bed per Day

Based on the results of the total cost to the hospital during the period under study, the total no. of beds in the indoor units under study, total no. of study beds, total no. of study cases on those study beds and the duration of study; the cost to hospital per bed per day was calculated.

Based on the observations following above mentioned steps, the cost to hospital per bed per day, as obtained is summarized specialty wise in the following Table 3.

ICU emerged out as the most cost intensive indoor unit under study followed closely by medicine and pediatrics.

Calculation of out of Pocket Cost to Patient Per Day

Based on the results of the total cost to the patient during the period under study and the total duration of stay for the respective specialty; the cost to patient per day was calculated.

The cost thus obtained, i.e. out of pocket cost per patient per day specialty wise is being summarized in the following Table 4.

ICU emerged out as the most and very cost intensive indoor unit under study. However, it is pertinent to mention here that the Casualty and OT were out side the scope of study.

The final average figure arrived at for cost to the hospital/ bed/ day in this study is ₹ 834.74 and cost to the patient/day

Table 5: Specialty wise break-up of total cost

Sl. no.	Specialty	Total cost per bed/day
1	ICU	10958.84
2	Medicine	1284.95
3	Pediatrics	772.58
4	Orthopedics	593.14
5	Surgery	493.87
6	Dermatology	397.34
7	Obs and Gyne	214.32
8	Psychiatry	175.46

came to ₹ 1026.57 on account of the Medicines, Surgical consumables and Crystalloids. Sharma YP (1997) in his study observed that the Total cost (direct and indirect) for inpatient care in the specialty of medicine was between ₹ 875 to 950 for the hospital.

Kannaraj V in a study of Neonatal Services at AIIMS in 1996 calculated the daily Neonatal Intensive Care Unit bed cost of ₹ 1408 per day which reflects the direct cost and overhead both.

Peter MC did a costing study in which he observed the ward cost for 159 patients staying 738 inpatient days, to be $ 58,280.

Total Cost of Medicines, Surgical Consumables and Crystalloids for Providing Medical Care in Different Specialties

All the cost thus obtained as of now were calculated department wise in two heads, i.e. cost to hospital and cost to patient. To arrive at the total cost, these two components were added (both the cost to hospital and cost to the patient). The data thus obtained was reflective of the total cost of inpatient care in the hospital across the departments.

The total cost per patient per day thus arrived are shown in the following Table 5.

The specialties of ICU, medicine and pediatrics emerged as biggest component as far as total cost is concerned.

Total average cost incurred on patient care in the indoor unit under study thus calculated came out to be ₹ 1861.31. The maximum total cost toward patient care came to ₹ 10958.84 for ICU. Whereas the lowest cost of ₹ 175.46 was for the psychiatry.

Relative Proportion of Cost to Hospital and Out of Pocket Expenditure Borne by the Patients in Total Cost — Specialty Wise

From the costs calculated so far, calculations were made to ascertain relative percentage of expenditure borne by the hospital and the patients to avail medial care in different specialities. The hospital was providing 92.96% of cost toward patient care in the specialty of pediatrics, whereas for medicine it was 87.48% of total cost followed by psychiatry which was 82.02%. Results are presented in the following Table 6.

Table 6: Percentage of cost borne by hospital and patient

Sl. no.	Specialty	Cost borne by the hospital (%)	Cost borne by the patient (%)
1	Pediatrics	92.96	7.03
2	Medicine	87.48	12.51
3	Psychiatry	82.02	17.97
4	Surgery	72.28	27.71
5	Obs and Gyne	64.24	35.76
6	Orthopedics	54.47	45.52
7	Dermatology	43.64	56.35
8	ICU	33.76	66.23

At the same time, the cost being borne by the patients was highest, i.e. 66.23% in the ICU followed by dermatology and orthopedics which were 56.35 and 45.52% respectively.

CONCLUSION

A total of 174 cases were included in the study fulfilling the selection criteria. The total length of stay of all the cases under study in days summed up to 2235 days in the indoor units under study.

The overall ALS across the specialty under study turned out to be 16.19 days.

Total average cost incurred on patient care in the indoor unit under study thus calculated came out to be ₹ 1861.31 per bed per day. The maximum total cost toward patient care came to ₹ 10958.84 for ICU. Whereas the lowest cost of ₹ 175.46 was for the psychiatry.

Cost to hospital per bed per day came to be highest for the ICU at ₹ 3700 followed by the specialty of medicine at ₹ 1124 whereas it came to ₹ 143 for psychiatry, the lowest.

At the same time the out of pocket cost to patient was again highest for the ICU at ₹ 7258 followed by dermatology at ₹ 223. It was minimum for the specialty of psychiatry again, at ₹ 31.

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ORIGINAL ARTICLE

Impact of Healthcare Marketing and Branding on Hospital Services

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ABSTRACT

Healthcare is one of the many human-centered services offered, the other being legal services, hospitality services, transport services, etc. The healthcare is also the foremost in all of these personal services. Every section of the healthcare experience must embody and convey the message that the hospital is the center of health and wellness in the community. The connection between healthcare provider and patient needs to be developed to improve the delivery model.

However with the rise of healthcare costs to providers, increase in operating costs, informative and knowledgeable customers; hospitals need branding to drive strategies, convey their expanding range of services, make an emotional connection with customers and create lasting relationships thereby generating profits.

Companies are losing out because there is often little or no integration between Corporate Social Responsibility (CSR) and marketing departments and their respective strategies. This misses brand building opportunities and may also confuse as well as disenfranchise company stakeholders.

Unless CSR becomes central to the marketing director's agenda, it will not have the desired effect and can potentially create a backlash. The nature of the business — category, customers, competitors — should dictate how much and in which ways, a company should promote its CSR-related activities.

Here, it lies the importance of developing a more strategic, distinct, sustainable and well defined brand platform. It is ultimately the hospital's brand and the customers' ability to trust that will aid in the decision-making process between competitive healthcare hospitals. Patient expectations and desires are changing, altering the competitive landscape. Employees are a hospital's most vital force and communication medium. Thus, the brand is the greatest asset for uniting employees around a singular culture and mission. This study highlights a conceptual framework that can be used for healthcare organizations to develop the revenues based on branding.

Keywords: Healthcare branding, Brand image, Corporate social responsibility, Integrated marketing communication, Customer satisfaction index.

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INTRODUCTION

Hospitals, nursing homes, hospices, physician practices, managed care organizations, rehabilitation centers and other health care organizations did not think about marketing until the early 1970s. In the early years, healthcare professionals did not like the amalgamation of the words healthcare and marketing. Many misconstrued marketing for advertising, and advertising for healthcare services was considered inappropriate. Therefore, healthcare service providers had long resisted the incorporation of formal marketing activities into their operations.

Now however, the environment is changing with focus shifting from an organization being product or service oriented to being user-oriented. The marketer aims to serve the customers in order to improve customer relationships and indirectly increase revenues of the organization.

BRANDING OF HEALTHCARE

Every hospital stands for a certain image or brand value either low cost care or specialized services. It is of essential importance that everyone on staff from the CEO to the volunteer at the reception desk should communicate the organization's mission effectively. The result is a brand-guided organization.

A favorable hospital brand image stimulates patient loyalty directly and also enhances patient satisfaction through the improvement of service quality, which in turn promotes the revisiting intention of patients. Thus, in the competitive healthcare environment hospitals thus should focus their marketing efforts on effective and strategic brand management. A brand can be defined as, 'the customer's perception of a product, service, experience or organization'. Thus, a brand from a marketing or consumer perspective is the promise and delivery of an experience; from a staff perspective is a culture and mission; and from a business perspective is the security of future earnings.

A brand is far more than a symbol. A brand is a symbol of self-expression that is used to gain acceptance. They embody tangible and intangible qualities that create value which influences both how an organization functions and how it is perceived, internally by the organizations workforce and externally by the customers.

BRAND IMAGE

Brand image is a composite of perceived quality and esteem dimensions. It is the perception of a brand that is held in a customer's memory and reflects the customer's overall impression. A positive brand image can be considered as a crucial ability of a corporation to hold on its market position. The brand is a valuable intangible asset, which is difficult to imitate, and which is helpful to achieve sustained performance.

The goal of branding therefore is to create a consistent perception of what a company stands for and what they believe in. There is substantial investment in branding but it has a huge payoff. Strong brands build differential equity. Brands make business easier because a business is known by the brand name that they carry. With so many services being part of the market and the customer being well informed, the commodity needs to be branded to leave an impression on the minds of the consumer. Therefore, it is imperative to always brand the service if the organization wants to be noticed, differentiated and viewed as more than just any other organization offering the same services as others.

In the healthcare context, Kotler and Shalowitz (2008) suggested that hospital brand image is the sum of beliefs, ideas and impressions that a patient holds toward a hospital. A brand image of a hospital is not absolute; it is relative to brand images of competing hospitals.[1] The patients often form a brand image of a hospital from their own medical examination and treatment experiences (Kim et al, 2008).[2] The growth of senior citizens population in our country and growing focus on health are dynamically increasing particular health wants and needs within the general populace. The current medical service market favors the buyer rather than the seller (Lee et al, 2010).[3] Hence, the field of medical service is now emphasizing the importance of customer-oriented marketing. Equally, any company undertaking and promoting CSR initiatives needs to be aware of the risks and benefits that accompany such efforts. This requires that CSR and marketing cooperate to develop a sustainable effort that brings competitive advantage. Simply talking about CSR is not enough, it needs to be supported by actual business practices, brand imaging, consistent communications and experienced by customers in very tangible ways.

This study encompases as a whole the importance of developing brand power of this hospital to sustain in today's competitive enviornment. The main goal of a marketer is the ability to create, enhance, maintain and protect brands. However, most product companies are aware of the strategic need to craft and manage brand identity. But, at many health-care service organizations, branding is not strategic but only tactical and frequently is limited to controlling the use of the corporate identity.

This is where the marketing department of Kasturba Hospital, Manipal, plays an important role in strategic brand management. Brand management involves the design and implementation of marketing activities and programs to build measure and manage brands to maximize their value. The brand management is being performed under following strategies.

STRATEGIC BRAND BUILDING

The brand should suggest something about the benefits of the service offered. It should suggest the qualities offered by the service. The brand building strategies focused by the organization under this study are as follows:

1. Corporate social responsibility
2. Loyalty programs
3. Integrated marketing communication.

Corporate Social Responsibility (CSR)

Corporate social responsibility has a number of definitions however in the context of a tertiary care hospital, the one defined by Kristiane and Posner is[4] 'conducting business in a responsible way that delivers value not only to the organization but also to its stakeholders and the community within which it operates.' Corporate social responsibility is about character and conduct, where integrity and responsibility run right through every seam of the organization's activities and ethos.

Loyalty Programs

Loyalty building requires the company to emphasize the value of its products or services and to show that it is interested in building a relationship with the customer.

A loyal customer is one who:

- Makes regular purchases
- Purchases across product and service lines
- Refers others
- Demonstrates immunity to the pull of the competition.

Integrated Marketing Communication

The first definition for integrated marketing communication came from the American Association of Advertising Agencies in 1989, defining IMC (integrated marketing communication) as: 'the approach to achieving the objectives of a

marketing campaign through a well-coordinated use of different promotional methods that are intended to reinforce each other.' The main advantage with IMC is that it uses the intrinsic strengths of each communication channel in order to achieve a greater impact together. In IMC models, there is often a lack of a specific hierarchy of importance—all components of the model play an equally important role in communicating their brand image.

SERVICE AND CUSTOMER SATISFACTION

Every organization is formed on the basis of key ingredients. In the field of medical service, Kim et al (2008)[5] adopted the concept of customer satisfaction and defined that patient satisfaction is the judgment of perceived value and sustained response toward service related stimulus before, during or after the consumption of medical services by a patient. Patient satisfaction is concerned with the degree to which the expectations of a patient are fulfilled by the medical services. Customer satisfaction may influence brand equity through one direct and one indirect channel. Remarkably, brand equity measures can include customer mindset as well as product market and financial market outputs related to brands (Ailawadi et al, 2003).[6]

Companies consider improved customer satisfaction as being a principal strategy for gaining loyalty, improving willingness to pay and enhancing the lifetime value of the customer to the firm (i.e. customer equity)[7,8]

AIM

To study the importance of marketing of services by an organization on its brand building and customer satisfaction.

OBJECTIVES

1. To study the marketing strategies followed and how the marketing strategies help to build the brand of the hospital.
2. To study the buying pattern of health card introduced by the organization.
3. To study the customer satisfaction indices over a 12-month period.

METHODOLOGY

The study is set in the Marketing Department of Kasturba Hospital. Kasturba Hospital is a 2,032 bedded, specialty and super-specialty medical and surgical care center. Kasturba Hospital (KH), Manipal, is an apex teaching hospital of the Kasturba Medical College (KMC), Manipal, under the aegis of Manipal University. Besides meeting the health demands of the western region comprising Goa, coastal Karnataka and Kerala, its healthcare network extends to the areas of interior Karnataka, primarily through its satellite hospitals as well as unique healthcare centers. It is recognized for treatment by central and state government, defence services and public sector companies.

The methods used are:

1. Studying the records of the marketing department to make note of: channels of advertising used by the hospital, number of camps conducted by hospital, role of Arogya card in building the brand, role of medical and nursing care in enhancing customer satisfaction during their stay in hospital.
2. A retrospective study was carried out to understand the trends of the patient traffic in hospital and trend in purchase of Arogya card by general public, referrals from camps. This helps in studying importance of marketing of services.
3. A retrospective data analyzed from the customer feedback cell of Kasturba Hospital, Manipal, to study the customer satisfaction index.

RESULTS

Kasturba Hospital, Manipal, is active in corporate social responsibility. The organization makes a conscious effort to be socially responsible in their actions toward the society and the community. However, the approach followed is a form of invisible CSR that is part of the culture of the organization. The hospital never believed in marketing their CSR efforts for building the brand image of the hospital.

There is a 'green card' initiative provided to the public who are below poverty line (BPL) by the government. All the green card holders are provided medical services as per government specified limits.

Manipal Arogya card (MAC): The Manipal Arogya card is issued by the Manipal University, as part of CSR. A family consisting of four people can be enrolled for ₹ 450 per annum.

The benefits for outpatients include concessions on consultation charges, discount on diagnostic services, up to 10% discount on medicines. The benefits for inpatients are discount on hospitalization charges, for stay in special and deluxe wards (excluding consumables), up to 10% discount on medicines, coverage of accident and emergency from the date of enrolment. Arogya card enrollments take place in the month of April, May and June every year. The scheme is valid from 1st August to 31st July of the next year. A comparative analysis is carried out in Graph 1, year-on-year, to understand the trend in new and renewed applications. As both have tripled in number, year over year, it shows customers are buoyed over the corporate social initiative

and the services provided by the card and users have showed enhanced loyalty.

Branding of the KH depends on a large extent to the marketing efforts of the marketing department which came into prominence from 2005.

The marketing department in KH utilizes various marketing strategies in order to help to build the brand of the hospital as part of the integrated marketing communications. The following observations were found:

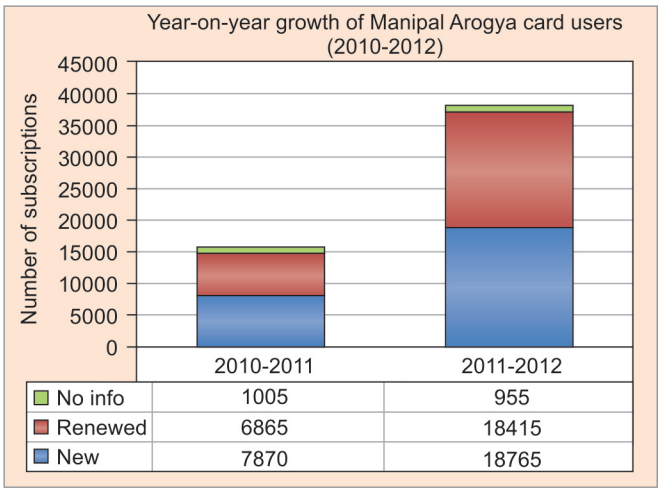
1. *Advertising and print media*: The advertising media is used for the projecting about KH and the various services it offers in local area, e.g.

Marketing machinery	*Frequency*	*Example*
Pamphlets	New service offering	Manipal Arogya card
Invites	Conferences	Continual medical education (CME)
Television (local TV)	Modified services	Introduction of 64 slice CT scan
Newspaper	New service offering	Manipal Arogya card

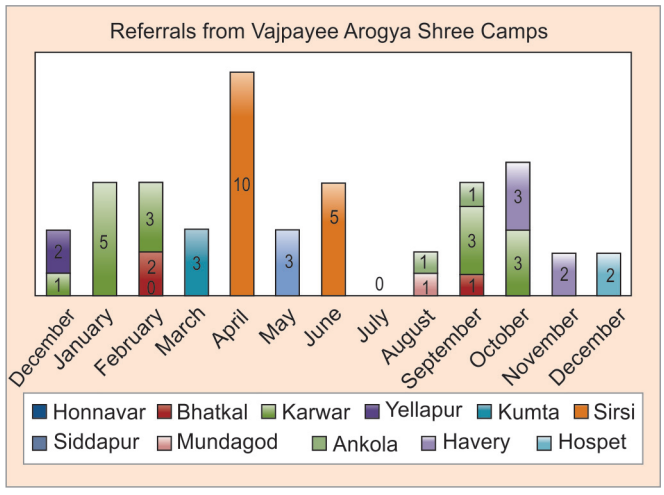
- The print media is also involved in publishing newspaper articles for wide geographical area coverage.
- The newspaper articles are printed in local languages such as Kannada.

2. *Promotion of services*: Every hospital looks to promote their services in a variety of ways. On discussions with the marketing department, it was understood that the hospital engages in promoting their services by using the help of various other media. The Vajpayee Arogya Shree (VAS) is promoted by KH. This program offers free services to BPL card holders. The statistics of the VAS program are discussed in the later part. The corporate empanelment helps in gaining recognition and indirect publicity.
3. *Events*: There are number of health events organized. The hospital follows a health calendar and celebrates special and important days in the year. Some examples of events organized are: The walkathon, Diabetes day. These events are organized to publicize the various services offered. It facilitates word-of-mouth communication which enables the community to take notice of the hospitals and the services offered by the hospital. These events are advertised by use of hoardings, pamphlet distribution and banners.
4. *Public relations*: The hospital maintains public relations through press coverage while organizing camps and by offering health checks to corporate houses under the Manipal Hospital's brand name.
5. *Interactive marketing*: Announcements are carried out about camps being conducted in a particular geographical area. The announcements are carried out in the local languages (Kannada, tulu or bohri) whichever is prevalent there.
6. *Direct marketing (continual medical education programs, CME)*: The hospital conducts conferences almost once every month, where doctors from the hospital interact with doctors in the surrounding areas which lack the facilities of a tertiary care hospital. There is exchange of information and direct marketing of services provided. These doctors then refer serious and chronic cases while the follow-up cases are attended to by the doctors. This forms a symbiotic relationship between the hospital and the doctors.

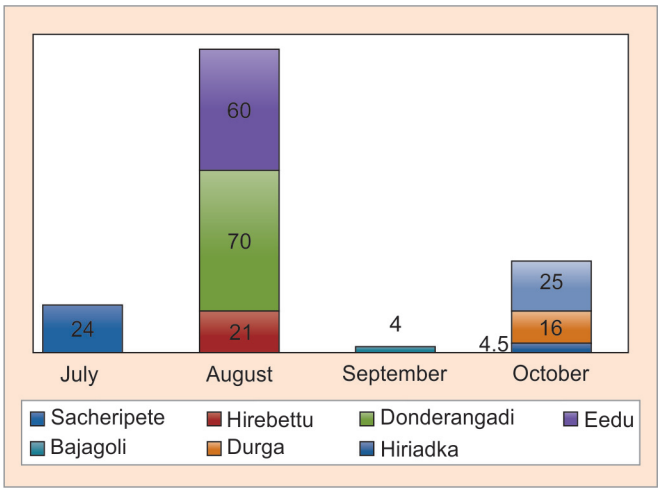
Another example of direct marketing is the camps that are conducted in various areas and regions. These camps can be divided into government schemed camps and special outreach camps. The information on the camps is given as follows:



Graph 1: Utilization of Arogya card by new and renewed customers



Graph 2: Referrals to tertiary hospital from VAS camps



Graph 3: Referrals to tertiary hospital from NGO camps

a. *Government scheme camps*: These camps include the Vajpayee Arogya Shree scheme users (VAS). The camp is conducted on fixed dates twice every month by the Karnataka Government. These camps are funded completely by the Government and informed to marketing department (KH, Manipal).

The marketing department conducts a press meet at the area designated for the camps 10 days prior to the commencement of the camps which is published in the newspapers while an announcement is carried out 2 to 3 days prior to the camp. This camp mainly concentrates on the below poverty line customers who are offered free treatment at KH, Manipal. Kasturba Hospital, is later reimbursed by the VAS. Graph 2 shows the statistics of VAS camps, and it also indicates the patient traffic from different geographical areas, which helps in marketing decision making.

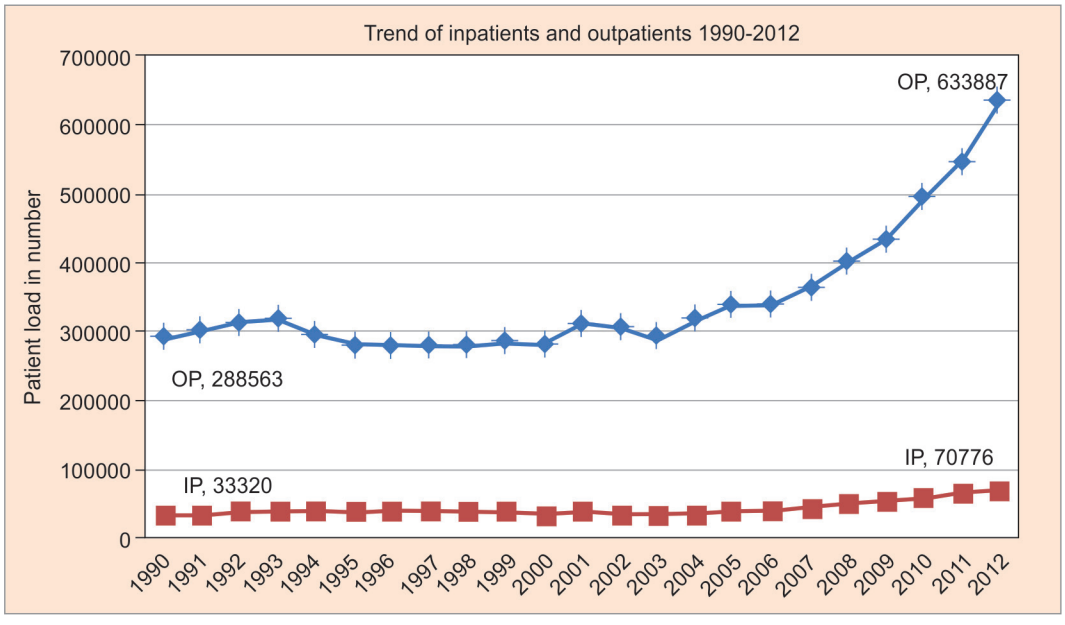
Graph 3 which indicates the patient traffic from particular geographical areas after conducting VAS camps.

b. *Special outreach camps*: The other camp wherein the marketing department plays a role is the special outreach camps which are conducted by NGOs (Nongovernment Organizations). A request through the NGO is sent to the medical superintendent. In these camps, the hospital only provides clinicians, staffs and consumables as requested by the NGOs. Graph 3 shows the statistics of the NGO camps.

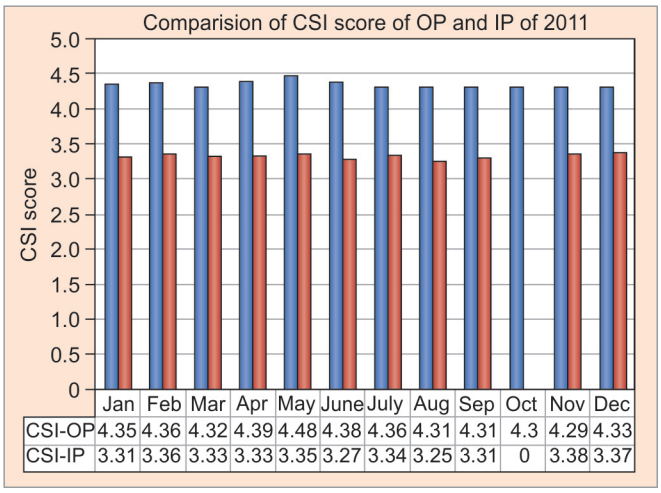
DISCUSSION

The following observations were made about how the elements present in the organization helps to play an important role in building the brand image of the hospital. On direct observations, the service, culture and reputation form the basis of KH, Manipal.

Graph 4 shows the trends of patient arrivals to the hospital year-on-year between 1990 and 2012. There is a steep surge in the numbers of outpatient attendance from 2005 onwards. Amongst the new and returned customers, the customer satisfaction indices were studied for 1 year period during 2011. The customer satisfaction index is calculated with the help of feedback process undertaken by the hospital. Feedback forms → distributed to the wards and outpatient department OPD (Inpatient and outpatient) → filled and returned by the patients during discharge → data collected is updated into the software → questions and their responses are numbered as 1 to 5 → one point given to each → responses are updated everyday → the CSI score is calculated every month. The average of answers to each



Graph 4: Trend analysis of census of hospital



	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec
CSI-OP	4.35	4.36	4.32	4.39	4.48	4.38	4.36	4.31	4.31	4.3	4.29	4.33
CSI-IP	3.31	3.36	3.33	3.33	3.35	3.27	3.34	3.25	3.31	0	3.38	3.37

Graph 5: Customer satisfaction index (CSI) of hospital services from both outpatients and inpatients for the year 2011

question sums to 5. So, the CSI score near to 5 is the best. The lesser the score away from 5 is seen as poor services.

The CSI score is collected for both inpatient (IP) and outpatient (OP) from the customer feedback cell for the period between January and December 2011. In 2011, the OPD census per annum were 5,50,506 and IP census per annum was 70,776. On any day, the sample size is 10% of day's census. The questions included in the questionnaire are about courtesy of staff at reception, communications by doctors in OPD consultation chambers, waiting times at laboratory services, food in in-patient services, etc.

Likert-type scales of five points were used to the latent constructs considered in this study (1 = poor and 5 = excellent).

Graph 5 shows the customer satisfaction index in the hospital for a period of 2011. The scores being above 4 consistently in every month, it is an excellent indicator from the users of the service about their satisfaction levels between very good and excellent. Most of the customers are happy with doctor's services, staff services, laboratory services. This improved customer satisfaction which will help in improving the loyalty by customers, improves brand image of the hospital, and enhance the willingness of customers to pay for the services. Customer satisfaction enhances the brand equity.

CONCLUSION

Reputation of an organization or service is extremely dynamic in nature, never constant. It is ever changing according to nature of the external forces.

One way of maintaining good reputation is with ideal marketing of services. There are various strategies to highlight services of a hospital. One of the important is the role of the print and advertising media, which has been highlighted in the study. A healthcare organization being a service organization attracts capable employees if they are provided optimum oppurtunities to enhance their knowledge. The role of camps in improving the number of patients being referred to a tertiary care center has been observed above. The role of word of mouth communication is difficult to measure, due to logistics involved.

Drawing on Mintzberg's work, different theorists stress that managers should adopt a broad perspective that integrates not only customers but also other stakeholders' interests and values to define a successful firm strategy.[9] Mintzberg also suggests that stakeholders with more power should receive greater care.[10] For healthcare organizations, the rewards of branding can be humongous, as it provides an opportunity to truly assess the needs of their users, develop capabilities to meet those needs and more effectively communicate the ability to meet those needs.

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ORIGINAL ARTICLE

Patient Rights: Awareness and Practice in a Tertiary Care Indian Hospital

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ABSTRACT

Aim and objectives: To study the awareness and practice of Patient rights and to compare the same between general and private ward hospitalized patients of a selected hospital.

Materials and methods: Descriptive research approach was adopted wherein data was collected from 120 hospitalized patients, i.e. 60 from general and 60 from private ward using a structured questionnaire. It was then analyzed by frequency, percentage and significance test to interpret the awareness and practice of patient rights in the hospital.

Results: The study reveals that awareness of patient rights was high in most of the cases. There was 71% awareness about the right to confidentiality, 67% awareness of the right to grievance redressal, 65% awareness about the right to be informed, 58% awareness of the right of access to healthcare and 55% awareness about the patient's right to choice of care and decision making. But low (39%) awareness was noted in case of patient's right to informed consent.

With regards to practice of patient rights, it was seen that certain rights were well-practiced like 95% practice of the right of access to healthcare, 89% practice of the right to confidentiality and 64% practice of the right to choice of care and decision making. But relatively lower percentage of practice was observed for right to be informed (49%), right to informed consent (44%) and the right to grievance redressal (21%). There was significant difference in the level of awareness and practice of patient rights among private and general ward patients in most of the rights.

Conclusion: The study was vital in finding that most respondents were aware of patient rights. So also, most of the patient rights were practiced in the hospital in varying degrees, while a few needed immediate rectification and management action.

Keywords: Patient rights, Awareness, Practice, Informed consent, Confidentiality.

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INTRODUCTION

The World Health Organization, whose mission is to ensure 'health for all' and the Universal Declaration of Human Rights (1948), recognizes 'the inherent dignity' and the 'equal and unalienable rights of all members of the human family', and it is on the basis of this concept of the person, and the fundamental dignity and equality of all human beings, that the notion of patient rights was developed. In other words, what is owed to the patient as a human being, by physicians and by the state, took shape in large part thanks to this understanding of the basic rights of the person.[1]

According to a study of the New York Health Strategy Group,[2] patients were very passive 30 years ago, but now-adays they are changing their attitude and becoming more health conscious and willing to make them heard. In view of this increasing gap between expectation and delivery of quality care, Patient rights have gained immense importance, especially for the purpose of statutory compliance in the field of medical practice.[3] The recognition and promotion of patients' rights has been enhanced by various factors, such as special reforms of some health systems, the continuing progress of medical science and biomedical technology, the turning of society to values arising from fundamental human rights, the important changes occurring in the doctor-patient relationship, and the simplification and popularization of medical knowledge, made accessible to people mainly through the mass media.

According to SK Joshi,[4] 'When we talk of the rights of a patient, we talk about the rights of a human being who is sick and suffering and needs help. It means his right to be provided the right kind of medical treatment by the right professionals at the right time using the right tools and techniques, with respect and human dignity, without any discrimination of any kind and much more than that. It means accountability of the providers for ensuring all the above in terms of the laid down norms and standards of quality.' As derived from above, patient rights are rights which may be classified as either legal, those emanating from law, or human statements of desirable principles, such as the right to healthcare/right to be treated with human dignity.[5]

Joshi further[4] states that, 'In India, unlike in many other countries, the rights of patients have not yet been spelt out in a legal form. However, certain laws enacted from time-

Table 1: Demographic details of the respondents

Age total (120)			*Gender total (120)*			*Educational qualification total (120)*			*Occupation total (120)*		
Category	*F	%	*Category*	*F	%	*Category*	*F	%	*Category*	*F	%
<30 years	15	12.5	Male	51	42.5	Illiterate	23	19.16	Laborer	10	8.33
31-45	45	37.5	Female	69	57.5	Primary	36	30	Skilled worker	41	34.16
46-60	35	29.16				SSLC	26	21.66	Professional	19	15.83
>61 years	25	20.83				PU	14	11.66	Retired	8	6.66
						Graduate	12	10	Student	9	7.5
						Postgraduate+	9	7.5	Unemployed	6	5
									Housewife	27	22.5

*Frequency

to-time and various judgments by the courts emanating from human rights, constitutional rights, civil rights, consumer rights and codes of ethics of medical and nursing profession have spelt out the obligations of the healthcare providers toward patients. This has, indirectly, conferred certain rights on the patients, such as the right of access to healthcare and to be treated with respect and dignity (IMC Regulations); the right to be informed (COPRA); the right to consent and choice of care (IMC Regulations); the right to privacy and confidentiality (IMC Regulations).'

The legal declaration of patient rights can be traced in the Consumer Protection Act,[6] NABH Standards[7] addressing the issue of Patient Rights in Chapter 4: patient rights and education (PRE) and the American Hospital Association: A Patient's Bill of Rights.[8]

Some of the basic, vital rights of patients are the right of access to healthcare with respect and dignity, the right to be informed, the right to confidentiality, the right to choice of care and decision making, right to informed consent and the right to redressal of grievances.

Research about patients' rights, the degree to which these rights are exercised and respected will reveal the existing situation for the care givers including healthcare administrators to help with the policy making and management of the services. Thus, the investigator wants to study the existing situation of the selected hospital so as to reaffirm the three (above stated) basic needs, paving a clear path toward statutory compliance and healthy patient caregiver relationship.

MATERIALS AND METHODS

A sample size of 120 hospitalized patients (10% from the total number of patients admitted), i.e. 60 from general and 60 from private ward were selected using the convenience random sampling technique. A questionnaire was designed consisting of three parts—demographical data, awareness of patient rights and the practice of patient rights, etc. Awareness and practice was assessed using a 3 scale rating (agree, not sure, disagree) questionnaire. For analysis, rating of 'agree' is considered as aware/practiced and rating of 'not sure and disagree' is considered not aware/not practiced.

The collected data was then analyzed in terms of frequency and percentage. Mannwhitney test and chi-square test was done. Item wise analysis of each right was done and then compared for private and general ward patients respectively. The data was presented in the tabular form with all the essential statistical values.

RESULT AND DISCUSSION

Demographic Details (Table 1)

Demographic data of respondents reveals that majority belonged to the age group ranging 30 to 45 years. Majority of the respondents were female and with primary education and employed as skilled workers.

Awareness of Patient Rights (Table 2)

Most of the respondents were aware of the meaning of patient rights (76%) and its goal (73%). But very few (43%) knew that it was applicable in India irrespective of the absence of a legal bill or charter. There was significant difference between private and general ward respondents and general wards respondents showing very low awareness (44%).

A study conducted by Fehime Zülfikar, M Filiz Ulusoy[9] revealed that only 23% of the participants were able to recognize patient rights, while 32% could not and the majority (45%) was undecided in recognizing patient rights. So also, Koula Merakou et al[10] found that 97.5% patients were not aware of the provision of patient rights. In comparison, this study has shown more awareness among patients on the concept of patient rights with respect to its meaning, goal and applicability.

Regarding the Right of Access to healthcare with respect and dignity; most (90%) respondents were aware that they could not be physically or verbally abused by hospital staff nor could be discriminated on any grounds during their stay (80%). But respondents rated low (31%) in awareness regarding access to their medical records as most did not know that they had a right to have complete knowledge and explanation of their records if they so desired.

Respondents did not have much awareness regarding their right to be informed as almost half of the subjects did

Table 2: Awareness of patient rights

Patient rights	*Total (120)*		*Private*		*General*		*Z-value*	***p-value*	*S*
	**F*	*%*	*F*	*%*	*F*	*%*			
Meaning of patient rights	92	76.66	57	95	35	58.33	4.7797	<0.0001	S
Goal of patient rights	88	73.33	56	93.33	32	53.33	4.9349	<0.0001	S
Applicability of patient rights	52	43.33	39	65	13	21.66	4.8679	<0.0001	S
Awareness on the concept of patient right	77	64.44	50	84.44	27	44.44	4.5644	<0.0001	S
Protection from physical/verbal abuse	109	90.83	56	93.33	53	88.33	0.934	0.3503	NS
Access to medical records	38	31.66	25	41.66	13	21.66	2.3686	0.0179	S
Nondiscrimination	97	80.83	55	91.66	42	70	2.9031	0.0037	S
Awareness on right to access of healthcare with respect & dignity	70	58.75	45	75.55	36	60	1.7541	0.0794	S
Information about illness	102	85	58	96.66	44	73.33	3.4809	0.0005	S
Information on cost of treatment	62	51.66	42	70	20	33.33	4.055	<0.0001	S
Information on research protocol	70	58.33	51	85	19	31.66	5.9926	<0.0001	S
Awareness on right to be informed	78	65	50	83.88	28	46.11	4.2351	<0.0001	S
Hospital/doctor/treatment choice	83	69.16	56	93.33	27	45	5.6846	<0.0001	S
Treatment alternative & refusal	51	42.5	36	60	15	25	3.8779	0.0001	S
Refuse/decline research protocol	64	53.33	46	76.66	18	30	5.0481	<0.0001	S
Awareness on right to choice of care and decision making	66	55	46	76.66	20	33.33	4.7296	<0.0001	S
Meaning of informed consent	28	23.33	17	28.33	11	18.33	1.3015	0.1931	NS
Procedures requiring consent	76	63.33	49	81.66	27	45	4.0841	<0.001	S
Consent in emergency case	40	33.33	25	41.66	15	25	1.8637	0.0624	NS
Awareness on right to informed consent	47	39.31	30	50.55	18	29.44	2.3529	0.0186	S
Confidentiality in patient information	103	85.83	57	95	46	76.66	2.9556	0.0031	S
Privacy in examination & treatment	107	89.16	60	100	47	78.33	7.5032	<0.001	S
Scope/extent of patient confidentiality	46	38.33	31	51.66	15	25	2.9339	0.0033	S
Awareness on patient's right to confidentiality	85	71.1	49	82.22	36	60	2.6556	0.0079	S
Complain regarding inconvenience faced	94	78.33	59	98.33	35	58.33	5.2889	<0.0001	S
File civil/consumer court case	64	55.83	39	65	28	46.66	2.0941	0.0363	S
Awareness on right to redressal of grievances	80	67.08	49	81.66	32	52.5	3.3653	0.0008	S

*F denotes frequency; **p < 0.05 is significant and p > 0.05 is nonsignificant; S: Significant; NS: Nonsignificant

not know that they had a right to know the treatment cost and also if there is any research protocol being practiced on them during their hospital stay (awareness @ 51 and 58% respectively). This was especially so in the case of general ward respondents (awareness @ 33 and 31% respectively).

A study conducted on Awareness and practice of patient's rights law in Lithuania[11] disclosed that statistically large proportion of the patients (69.0%) were aware of the statement that being informed about the diagnosis, medical treatment results and treatment methods was necessary. Additionally, Diagnosis and results of the medical examination were better understood, by 82 and 73% of the patients, respectively. In comparison to the above study, there is an equally high percentage of awareness on the right to information among patients of this selected hospital.

Awareness regarding right to choice of care and decision making was also very low (55%) as it was seen that most respondents were not aware that they had a right to know the other treatment alternatives (only 42% were aware) and refuse care option suggested by their doctor if need be. So also very few (53%) respondents were aware that they could refuse being part of any research or human experiment and even withdraw during the protocol if they felt the need to do so.

Most respondents showed very little awareness (39%) regarding the right of informed consent where most of them did not even understand the meaning of an informed consent and others did not know that a consent was not needed in case of emergency treatments (only 23 and 33% awareness respectively). Although 63% were aware of the common

Table 3: Practice of patient rights

Patient rights	*Total (120)*		*Private*		*General*		*Z-value*	***p value*	*S*
	**F*	*%*	**F*	*%*	**F*	*%*			
Treated with respect and dignity	111	92.5	57	95	54	90	1.0398	0.2985	NS
No gender/religion-based discrimination	117	97.5	60	100	57	95	–9.3229	<0.0001	S
No discrimination on financial grounds	115	95.83	60	100	55	91.66	–8.8735	<0.0001	S
Practice of right of access to healthcare with respect and dignity	114	95.27	59	98.33	55	92.22	1.5079	0.1316	NS
Information about illness and treatment	82	68.33	47	78.33	35	58.33	2.3483	0.0189	S
Treatment cost well explained	36	30	18	30	18	30	0	0.9999	NS
Practice of right to be informed	59	49.16	33	54.16	27	44.16	1.0957	0.2732	NS
Patient choice and decision respected	77	64.16	53	88.33	24	40	5.4772	<0.0001	S
Practice of right to choice of care and decision making	77	64.16	53	88.33	24	40	5.4772	<0.0001	S
Well informed consent	53	44.16	42	70	11	18.33	5.7378	<0.0001	S
Practice of right to informed consent	53	44.16	42	70	11	18.33	5.7378	<0.0001	S
Privacy in all procedures	108	90	55	91.66	53	88.33	0.536	0.5919	NS
Patient and patient party privacy	106	88.33	58	96.66	48	80	2.6968	0.007	S
Practice of right to confidentiality	107	89.16	56	94.16	51	84.16	1.7505	0.08	NS
Grievance redressal system	26	21.66	13	21.66	13	21.66	0	0.999	NS
Practice of right to redressal of grievances	26	21.66	13	21.66	13	21.66	0	0.099	NS
Patient rights claim and provision	96	80	53	88.33	43	71.66	2.3065	0.0211	S
Practice of rights claim and provision	96	80	53	88.33	43	71.66	2.3065	0.0211	S

*F denotes frequency; **p < 0.05 is significant and p > 0.05 is nonsignificant; S: Significant; NS: Nonsignificant

procedures which required their consent but whether an informed one was still a doubt to them.

In comparison, a study on patients' perceptions of written consent[12] revealed that most participants (646, 88%) believed it was a legal requisite to sign a consent form before surgery. Nearly a quarter (169, 23%) did not know whether the operation could be performed if they were unable to sign the consent form, even if non-intervention could result in their death (in cases of emergency), and 55 (8%) mistakenly assumed it could not. Most patients (86%) thought their signature confirmed that they understood what was going to happen to them, and that there are risks involved in having surgery (82%).

In case of right to confidentiality, the respondents rated better (71%) in awareness as most (89%) of them were aware that they had the right to privacy during their examination and treatment and 85% were aware that their patient-related information had to be maintained confidentially in the hospital.

It was also interesting to observe that most (78%) of the respondents were aware that they had the right to redress their grievances faced during their stay but only about 55% said that they could file a civil/consumer court case if necessary to redress their grievances.

A study carried out by Koula Merakou, Panagiota Dalla-Vorgia, Tina Garanis-Papadatos and Jeny Kourea-Kremastinou[10] found that one out of four patients (25.7%) would do nothing if some of his or her rights were violated. Less than one-third (28.8%) would make a complaint to the particular person responsible for the violation; 27.5% would complain to that person's superior; 13.3% would submit a written complaint to an administrative officer; and 3.5% would appeal to a court.

There was significant difference in the level of awareness of private and general ward patients in almost all the rights presented. This may be a result of the varying level of educational qualification of the respondents in private and general wards. Although there was no significant difference in the awareness level between the two comparison groups with regards to the awareness on the right to access of healthcare without being physically or verbally abused during their stay. So also, there was no significant difference in case of the awareness regarding the meaning of Informed consent and the need for consent during an emergency. In these two cases, both the groups were found unaware and confused.

Practice of Patient Rights (Table 3)

With respect to the practice of patient rights, it was seen that the respondents felt that their right to access of healthcare with respect and dignity was highly practiced. With above 90% respondents saying that the staff treated them with respect and dignity and there was no discrimination on the grounds of gender, religion or finance.

Table 4: Relationship between awareness and practice of patient rights

Patient rights	*Awareness (120)*		*Practice (120)*	
	Frequency	*%*	*Frequency*	*%*
Right of access to healthcare	70	58.75	114	95.27
Right to be informed	78	65	59	49.16
Right to choice and decision making	66	55	77	64.16
Right to informed consent	47	39.31	53	44.16
Right to confidentiality	85	71.1	107	89.16
Right to redressal of grievances	80	67.08	26	21.66
Overall	72	59.88	76	63.33

Most (68%) respondents marked that they were informed of their illness and the treatment but very few (30%) were well explained regarding the costs that were involved. This was same for both private as well as general ward patients. In comparison, a cross-sectional survey from a tertiary care hospital on the east coast of Peninsular Malaysia[13] found that about 85% of patients felt that they were informed regarding their illness and modality of treatment; however, treatment options were discussed with only 45% of the cases and only 65% of patients were informed of the duration of their treatment.

Regarding the right to choice of care and decision making, it was seen that more than half (64%) respondents felt that their choice/decision was respected and upheld at all times by the staff.

Unfortunately very few (44%) responded that they had given an informed consent to the procedures related to their treatment. This was extremely less in case of general ward patients where only 18% had given an informed consent.

A study conducted by Andrea Akkad, Clare Jackson, Sara Kenyon, Mary Dixon-Woods, Nick Taub and Marwan Habiba[12] disclosed that many patients (71%) agreed that the consent form made clear what was going to happen to them, and 77% reported that it made them aware of the risks of the operation they were to undergo. Compared to the above study, this is indeed a negative rate of practice. It must be noted that all had signed on the consent form but very few (the above stated percentage) were fully explained and informed of the consent.

Right to confidentiality was well practiced as most of the respondents rated practice of confidentiality and privacy during their procedures and stay above 85%.

The hospital faired poorly with respect to the respondents' rating only 21% regarding the presence of a grievance redressal system in the hospital which is a right of the patient. This was true for both, private and general ward patients with no significant difference between the two.

But ironically, majority (80%) of the respondents said that most of the rights were well-practiced and they feel confident enough to claim them in the hospital.

It was also noticed that there was significant difference in the practice and delivery of patient rights in case of private and general ward patients esp. with regards to the right to choice of care and decision making, right to informed consent and confidence in claiming once rights in the hospital where the general ward respondents expressed lesser rate of practice of these rights during their stay. This although has to be looked into carefully by the hospital authorities.

Comparison between Rate of Awareness as against Practice (Table 4)

As the rate of patient right awareness and its practice was compared, it can be seen that in most of the rights there was high awareness except the right to informed consent, while many rights were not satisfactorily practiced in the hospital like the patient's right to be informed, right to informed consent and the right to grievance redressal.

But some interesting conclusions may be drawn on the basis of the study: although awareness regarding patient's right of access to healthcare with respect and dignity was only 58%, it was very well practiced at the rate of 95%. The same applies to the right to confidentiality. But problem lies in other areas wherein the respondents are aware of their rights but these are not practiced well in the hospital according to the respondents. For example, the right to be informed (78% as against 49% respectively), the right to choice of care and decision making (66% as against 64%), right to informed consent (47% as against 44%) and the lowest being the right to grievance redressal (67% as against 21% respectively).

CONCLUSION

The crux of this study was to find the level of awareness and practice of patient rights among hospitalized patients. There was high awareness about patient rights among the respondents except regarding the right to informed consent and right to choice of care and decision making. With regards to practice, some rights were not satisfactorily practiced in the hospital like the right to grievance redressal,

right to informed consent and the patient's right to be informed.

There was significant difference noted in the level of awareness and practice between the private and general ward patients. Based on the analysis and findings, suggestions were made, which would result in the hospital being well-equipped in meeting any statutory compliance, fulfilling any accreditation criteria and providing qualitative patient-centered care.

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ORIGINAL ARTICLE

A Study of Prescribing Practices in Outpatient Department of an Apex Tertiary Care Institute of India

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ABSTRACT

Introduction: Poor quality prescriptions, besides affecting patient safety, have a deleterious impact on the restricted purse of sick persons, especially those belonging to lower socioeconomic strata.

Objective: To study the prescribing practices in outpatient departments of an apex tertiary care institute of India.

Methodology: Descriptive and observational study of randomly taken sample of 300 prescriptions from pharmacy was carried out. Parameters for analysis were selected based on review of literature.

Observations: Of the total samples analyzed, OPD registration number, date of registration, patients name, gender and department were mentioned in 99.3% of prescriptions. Patient name was mentioned in all the prescriptions and gender was present in 99% prescriptions. Address of the patient was present in only 64.7% (194) prescriptions. 93.7% of the prescriptions were legible. Ninety-seven percent of the prescriptions carried diagnosis or presenting complaints. An average of 2.82 ± 1.77 (median – 3) drugs were prescribed per patient. Only 1.63% (14) prescribed drugs were generic. In our study, antacids (26.33%) followed by the vitamins (24%), analgesics (23.3%), antibiotics (22.8%) and antipyretics (18%) were the most commonly prescribed drugs. Drug strength, drug frequency and drug administration route was mentioned in only 62, 89 and 89% of the total prescriptions. Fifty percent did not carry the duration and mean duration of prescription was 17.75 ± 24.18 days. Signature, name, designation, address, stamp and medical registration number of the physician was mentioned only in 96.7, 7.3, 6.7, 2.7, 0.7 and 0% of the prescriptions respectively.

Conclusion: The study has brought out the need for sensitization and awareness programes for doctors to improve the quality of prescription-writing and periodic review of prescriptions.

Keywords: Prescription, Prescribing practices, Audit, Outpatient department.

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INTRODUCTION

The burgeoning cost of drugs prescribed across the country is a major concern. Correct diagnosis, accurate treatment, use of prescribed medicines as directed and timely follow-up are four crucial steps for a favorable outcome of a patient's disease management. In order to ensure that the prescribed medicines are used correctly, it is imperative that the patients get the intended medicine in the first place.[1]

Medication problem is potentially tragic and costly in both human and economic terms, for patients and professionals alike. In health care setting, there are many problems regarding drugs administration which includes errors in prescribing and transcription.[2] The irrational use of drugs by both prescribers and consumer is in fact a global problem which can be assessed by a standardized method of prescription analysis.[3]

The deleterious impact of poor quality prescriptions, under and over-dosing, duplication and multiplicity of drugs on the restricted purse of sick persons, particularly those belonging to lower socioeconomic strata, which also adversely affects their households as a whole in terms of the non-health expenditures, such as food, clothing and education.[4] Apart from having a negative impact on work flow in practice, prescription errors may pose threat to patient safety.[5] The problem related to prescribing medication has not been adequately studied, especially in developing countries.[6] One of the ways of assessing prescribing practices is 'prescription audit (PA)', with which prescribers get regular feedback about their prescriptions.[7] Hence, the present study was carried out with an aim to analyze the prescribing practices in the outpatient department of the apex tertiary care public institute of Northern India.

This 2000 plus bedded multispecialty tertiary care public hospital includes independent centers for ophthalmology, cardiothoracic, neurosciences, cancer treatment. It also has centers for trauma, drug dependence treatment and dentistry.

In a first-of-its-kind public-private partnership, a 24 × 7 central pharmacy shop was opened in the institute with the mandate to provide all medicines and surgical consumables, at a discount of more than 50% on maximum retail price, prescribed to patient visiting hospital.

METHODOLOGY

A descriptive and observational study was carried out in outpatient department of the institute for a period of one month, i.e. October 2012. Prescriptions received at central pharmacy shop were analyzed which included prescriptions from all the centers.

Central pharmacy shop was chosen in order to draw sample from the entire institute. A total of 300 prescriptions collected over a period of 6 days during the working hours of OPD from Monday to Saturday (to account for daily variation) were studied. Daily 50 prescriptions were selected through simple random sampling. All the prescriptions were included in the study irrespective of patients visit (1st visit or follow-up). All the prescription received at the central pharmacy shop irrespective of the fact whether drugs have been prescribed or not were included in the study. Prescriptions collected at the pharmacy shop had following advantages:

- It had an element of natural randomization.
- It consisted of prescription from all the departments within the institute.

Parameters (Table 1) to be studied were identified through review of literature which included WHO core prescribing indicators.[3]

Composition of drugs prescribed by brand name was deciphered from MIMS India website. Data was analyzed using Microsoft Excel 2010.

OBSERVATIONS

In total 300 prescriptions were collected from central pharmacy shop which comprised of prescriptions from Multispecialty Hospital (77%) followed by Cardiothoracic and Neurosciences Centre, Centre for Ophthalmic Sciences, Regional Cancer Hospital, Dental Centre and Trauma Centre. Prescriptions studied were from more than 30 departments with maximum number of prescriptions from department of medicine (19%) followed by orthopedics (8.3%), dermatology (6.3%), pediatrics (5.3%) and so on.

99.3% (298) prescriptions carried registration number and date of the visit, while name of prescribing department was found missing in only 0.7% (2) prescriptions. Patient's name was mentioned in all the prescriptions and gender was present in only 99% (297) prescriptions. Only 64.7% (194) prescriptions carried the patient's address.

Majority, i.e. 93.7% (281), of the prescriptions were legible as analyzed by the principal investigator. Diagnosis/presenting complaints were mentioned in 97% (291) prescriptions. An average of 2.82 ± 1.77 (median-3) drugs was prescribed per patient with no drugs prescribed in 8.0% (24) prescription. Two drugs per patient were most commonly (26.7%) prescribed followed by three drugs (24%). In 64% (191) patients, total number of drugs prescribed were less than or equal to 3, while in 28% (85) prescriptions number were greater than or equal to four drugs were prescribed. Maximum number of drugs prescribed was observed to be 9 (Graph 1).

Of the total 847 prescribed drugs only 1.63% (14) drugs were generic. In our study, antacids (26.33%) followed by the vitamins (24%), analgesics (23.3%), antibiotics (22.8%) and antipyretics (18%) were the most commonly prescribed drug groups (Graph 2). Injectables were prescribed in only 5.7% (17) patients and most of them were either chemotherapy or emergency prescriptions. 22.7% (68) patients were prescribed one or more than one antibiotic.

Table 1: List of parameters

Demographic and general profile of patients
UHID/outpatient registration number
Name
Age
Gender
Outpatient department
Center within AIIMS
Legibility
Prescribers detail
Name
Qualification
Address
Telephone number
Signature
Date of signing the prescription
Medical council registration number
Prescription bearing the rubber stamp of prescriber
Diagnosis/presenting complaints
Prescription body
Average number of drugs per prescription
Percentage of drugs prescribed by generic name
Percentage of encounters with an antibiotic prescribed
Percentage of encounters with an injection prescribed
Percentage of encounters with a vitamin prescribed
Percentage of encounters with an analgesic prescribed
Percentage of encounters with an antipyretic prescribed
Percentage of encounters with an antacid prescribed
Route of administration
Strength of preparation
Frequency of administration
Duration of treatment
Drug allergies
Instructions for intake
Follow-up advice

Drug strength was mentioned in only 62% prescriptions, while missing in 30%. Drug frequency and drug administration route was mentioned in 89% (267) of the prescriptions and was missing in 3% (9). Duration, for which the prescriptions were issued, ranged from 1 to 180 days and mean duration of prescription was 17.75 ± 24.18 days (median 14 days) and in almost half prescriptions duration of the prescriptions was missing. Follow-up advice was present in only 38.7% (116) prescriptions while only 43.3% (130) carried instructions for intake.

In our study, prescriber's signature was present in only 96.7% (290) prescriptions, while only 7.3% (22) carried prescriber's name. Designation and date of prescription was mentioned in only 5.7% (17) and 6.7% (20) respectively (Graph 3). Address of the prescriber was rarely mentioned in prescriptions and none of the prescriptions carried telephone number and medical council registration number (see Graph 3).

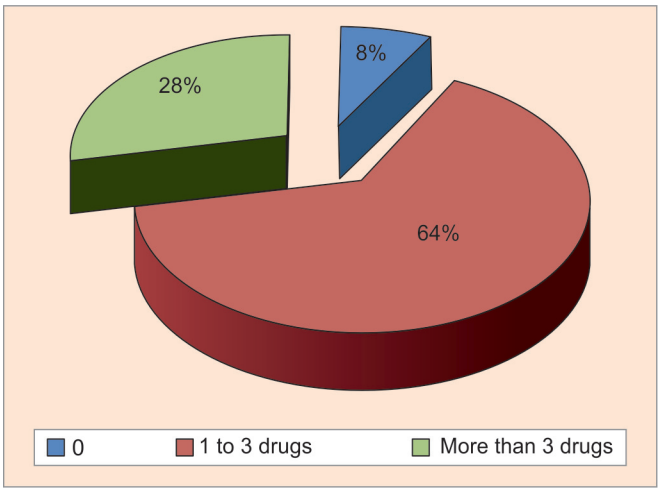
DISCUSSION

This study was conducted in outpatient departments with an objective to gain an insight into the prescribing practices from patient safety point of view. All the departments were included in the study leading to reflection of prescribing practices across the institute but limited in extrapolation due to smaller sample size.

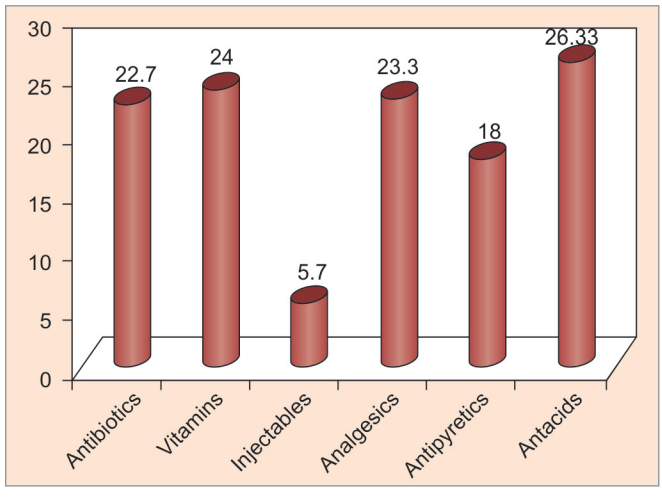
Our study showed that the institute has got good patient registration system in place as OPD registration number, date of registration, patients name, gender and department was mentioned in 99.3% of prescriptions although address was missing in 35.3%. While a study conducted in Maharashtra revealed that date of registration, case file number, department and address was mentioned only in 94.6, 26.4, 80.4 and 0% of prescriptions.[8] Similarly, a study conducted in Lucknow revealed that patient details were lacking in considerable prescriptions.[9] In a study of Ethiopian teaching hospital, it was observed that age, gender and OPD numbers were not recorded in 36.6%, 16.8% and 12.4% of the prescriptions respectively,[10] while in Dubai hospital study patient's name, age and gender was present in 97.1%, 90.3%, and 88% of prescriptions respectively. In addition, none of the prescriptions carried the address, diagnosis or allergy of the patient.[11] This variation may be ascribed to the type of registration system, institute in study has centralised computerized registration system, resulting in good results.

Majority (93.7%) of the prescriptions were legible. In an international study evaluating the quality of prescriptions, it was found that 32.39% of the prescriptions were not legible.[12] According to a study done in Sri Lanka, 208 (25.6%) of total prescriptions were illegible.[13] In a study of rural tertiary care hospital, a significant number of the prescriptions (17.6%) were written in illegible handwriting and not easily readable.[8] In this study, diagnosis/presenting complaints were recorded in almost all (97%) of the prescriptions. In an Indian study, the diagnosis was mentioned only in 22.25% of the prescriptions.[14] In a study done in Nepal, most commonly observed problem on the prescriptions was the absence of diagnosis (11.3%). Other problems noted were the absence of the duration of the prescribed (5.4%), age (3.8%) and sex of the patient, drugs (4.3%) and the date (3.2%) on the prescription.[15]

Prescription of drugs by the brand name is one of the key problem that hospital administrator faces across the globe. Various Indian studies have shown that generic drugs being prescribed varies from 1 to 60%,[9,16-19] while studies done in Bangladesh,[20] Sri Lanka[13] and Karachi[21] revealed the prescription of generic drugs to be 78, 36.7 and 12.26% only. In this study, it was observed to be significantly low, i.e. 1.63% when compared against the international study findings describe above. Therefore, policy formulation and

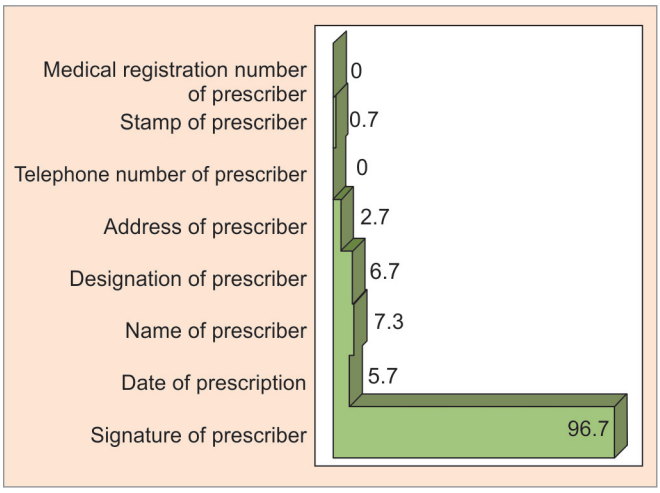


Graph 1: Number of drugs prescribed per patient



Graph 2: Most commonly prescribed group of drugs*

*Antacids include proton pump inhibitors



Graph 3: Prescriber's detail in studied prescriptions

prescription of drugs by generic name needs to be promoted as it increases the healthcare availability by reducing the treatment cost.

Average number of drugs prescribed per prescription is an important indicator of prescribing practices. A study done among medical practitioners at Pune, the average number of drugs per prescription was 2.81 ± 1.22 (range, 1-13),[22] while in a teaching hospital of Southern India, it was 3.75 drugs.[23] Whereas a study conducted in Indonesia, it was found to be 3.2 drugs[24] and 4.51 in a study of Karachi.[21] Similarly, an average of 3.04 ± 1.39 were prescribed as per a study coducted in a tertiary care hospital of Nigeria.[25] In this study, average number of drugs per prescription was calculated to be of 2.82 ± 1.77 (range 0-9) drugs. Average number of drugs prescribed in the institute is comparable to the national and international studies mentioned above.

In our study, antacids (26.33%) followed by vitamins (24%), analgesics (23.3%), antibiotics (22.8%) and antipyretics (18%) were most commonly prescribed drug groups. While a study in northern part of the country revealed NSAIDs to be the most widely prescribed (89.75%), followed by antibiotics (77.25%) and vitamins (59.74%).[14] Similarly, a study conducted in Dubai revealed that most commonly prescribed therapeutic drug class was NSAIDs (23.4%), followed by antibiotics (21.4%), etc.[11] Whereas in a study vitamins and other supplements (25.6%) followed by antibiotics and anti-infective (20.6%), and nonsteroidal anti-inflammatory drugs (NSAIDs)/antipyretics (17.7%) were commonly prescribed drug groups.[9] In a study done in a teaching hospital, the most commonly prescribed drug group was antimicrobials which accounted for 27% of the drugs.[23] In a study done in Nigeria, analgesics, anti-malarial, vitamins and anxiolytics were prescribed in 36.2, 19.1, 9.7 and 1% of encounters.[25] Commonly prescribed drug groups in the institute are similar that have been found in above-mentioned studies.

Analysis of our study finding revealed that drug strength, frequency and administration route were mentioned in only 68, 89 and 89% prescriptions respectively. In half of the prescriptions, duration for which the medicines needs to be taken was not advised and follow-up advice as well as instructions for intake were mentioned in 38.7 and 43.3% prescriptions respectively. In a study in Jammu, the frequency of drug use and dosage form has been noted for 98 and 94% of the prescribed drugs respectively. The duration of therapy has been recorded in 75% of the drugs prescribed.[16] In a study of rural tertiary care hospital, the strength, quantity and route of administration of the drug were found on 73.1, 65.3 and 75.2% prescriptions.[8] In a study of Nigerian teaching hospital, 12, 7, 6.4, 5.8 and 1.6% of the prescriptions did not indicate routes of drug administration, directions for drug use, frequency of drug administration, drug dose and duration of treatment respectively. No prescription order had special advice or warnings to the patient and, in 10.8% of the cases, date was omitted.[10]

In this study, signature, name, designation, address and stamp of the physician were present only in 96.7, 7.3, 6.7, 2.7 and 0.7% of the prescriptions respectively, while none of the prescriptions carried medical council registration number of the physician. Similar findings were observed in a study where name of the physician, signature, speciality, license or registration number and address were omitted in 12.2, 10.3, 20.3, 54.9 and 100% of prescriptions respectively.[11]

The parameters included in this study are quite comprehensive and touches almost every aspect of prescribing practices right from the registration till the closing of prescription. Many studies contained several other parameters but could not be included in this study due to resource constraint. It is advised that due caution must be taken before extrapolating the findings of this study over a wider population, since this study was carried out in a single institute with limited sample size. In future multicenter studies with a larger sample size may give us better insight; however, this study has identified key areas which require intervention and may be of relevance in similar institutions.

CONCLUSION

It has been generally observed that system of OPD registration is good but problem areas are the body and closing of the prescription. Prescribing medicines by brand name is a cause of worry, especially in developing country like India as it increases the cost of healthcare. Prescription audit forms a very important component of medication management as well as an essential component of patient safety. It provides us with data which can be utilized for performance improvement programs and help to reduce medication error. The study has brought out the need for sensitization and awareness programs for doctors to improve

the quality of prescription-writing and periodic review of prescriptions. Sharing of findings of prescription audit will not only help in improving the prescribing practices but would also promote the patient safety culture in the organization.

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ORIGINAL ARTICLE

Economic Evaluation of an Eye Hospital in Terms of Net Present Value and Profitability Index

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ABSTRACT

Introduction: Hospital projects are highly cost intensive and therefore, it takes few years to become a profit oriented entity. The success of these hospital projects can be measured through various economic evaluation methods. Economic evaluation can also be called as an effort to analyze inputs and outputs together and logically help decision makers evaluate whether a certain level of output is worth the amount of resources expended to produce it.

Method of the study: The present study was planned to do the economic evaluation of an Eye hospital, in Haryana state. Two parameters were considered for evaluating the project, i.e. Net Present Value (NPV) and Profitability Index (PI). The data used in the study was from 2010-2011 to 2016-2017. This includes actual and projected data.

Result and conclusion: A positive NPV explain the project is worthwhile and making profits, with current cost and revenue projections. PI for this center is found out to be 3.47 which also emphasize that the project is a value for money proposition.

Keywords: Economic evaluation, Net present value, Profitability index.

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INTRODUCTION

Economic evaluation is a 'comparative analysis of alternative courses of action in terms of both their costs and returns'.[1] It can also be called as an effort to analyze inputs and outputs together and logically help decision makers evaluate whether a certain level of output is worth the amount of resources expended to produce it. Two essential features of this definition are worth noting. Firstly, economic evaluation involves a comparison between alternative courses of action. Secondly, the options are evaluated in terms of both their costs and their benefits. The oldest type of economic evaluation is cost benefit analysis through which questions primarily of allocative efficiency are addressed. Even if not everything can be valued in monetary terms, a cost-benefit framework is still useful as all impacts on costs and benefits can be laid out in a 'balance sheet' to highlight where trade-offs can be, or are being made between tangible items (usually costs) and some intangibles.[2]

With the rise in healthcare costs, it is very essential to economically evaluate the healthcare units so as to find the ways of increasing the profits and minimize costs and wastage.[3] Health care economic analyses are becoming increasingly important in the evaluation of healthcare interventions, including many within ophthalmology. Encompassed with the realm of healthcare economic studies are cost-benefit analysis, cost-effectiveness analysis, cost-minimization analysis, and cost-utility analysis.[5] These specific techniques of economic evaluation can be used to address whether a program, project or intervention offers good value of money. The techniques of economic evaluation offer a systematic framework for identifying, measuring and valuing the resource inputs (costs) to a healthcare project and associated benefits (health outcomes and revenue generated).

Apart from the patient care, budgeting and revenue generation are two important areas which are looked upon by the hospital managers. The main focus is to minimize the costs and maximize the earned revenue. To do so, the management must have thorough understanding of the costs involved in the system and the outcomes and benefits as to ensure that the hospital project is a valuable proposition or not. Resources are scarce, especially healthcare resources. Therefore all organization's involved in healthcare are concerned with the securing value for money from their investments. Organizations need to be able to calculate the return precisely, a project yields. When a cost-benefit analysis is performed, a comparative assessment of all the anticipated benefits from the project and all the costs to introduce the project, operationalize and support it, are identified.

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Cost-benefit analyses help to:

- Decide whether to undertake a project or decide which of several projects to undertake.
- Frame appropriate project objectives.
- Develop appropriate before and after measures of project success.
- Prepare estimates of the resources required to perform the project work.

Thus, a cost-benefit analysis is most helpful tool in management arsenal. The present study was planned to do the economic evaluation at an Eye hospital, in Haryana state. The main aim of the study is to analyse whether the center is viable or not.

The costs involves in the economic evaluation could be resource costs: capital costs (new and existing buildings or equipment); staffing costs (physicians, nurses, physiotherapists, etc.); consumable costs (drugs, dressings, etc.); nonpatient related costs (administration and overhead costs); costs incurred in nonhealth care sectors (social services, etc.); and costs incurred by patients and their families (transportation, parking, child care, etc.).[9] These costs could be fixed or variable. The outcomes could be in terms of health utility, Quality Adjusted Life Years (QALY), revenue and time trade-offs.[2] An economic evaluation study carried out by Goor et al (2010) compared the costs involved at the hospital's end in glaucoma follow-up group and glaucoma specialist group assuming that the health outcomes in both the groups are same.[4] The results of the study showed that healthcare costs were significantly lower in glaucoma follow-up unit. Thus, this method of treatment could be adopted at other eye hospitals as well.

When considering the role of economic evaluation in health technology assessment, identify four stages at which economic evaluation can take place.[6] These are early developmental (stage 1); maturing innovation (stage 2); close to widespread diffusion (stage 3); and moving into practice (stage 4). Stage 1 comprises the systematic review of evidence relating to the cost and effectiveness of existing experience and the use of informal clinical opinion to assess the potential value of the new technology. Stage 2 includes modeling studies using the data from existing clinical studies, and the pilot studies of economic data collection alongside controlled trials. Stage 3 involves economic data collection alongside RCTs and refined modeling studies using systematic overviews of clinical data. Finally, stage 4 involves economic data collection alongside pragmatic trails and modeling studies to generalize results to other settings or to extrapolate to the long-term.

Tallying up all the cost components may yield overlapping areas of similar resource use, such as two variously busy clinics (one a very busy clinic and the other a not so busy clinic). In this case it becomes difficult to disentangle the true proportion of overhead expenses (electricity, heat, rent of hospital space, etc.) which is being consumed separately. Under such circumstances, the aim is to make a reasonable estimate of the various amounts involved, including such matters as the number of employees, the size or area of clinic space used, the number and volume of patients seen, etc.[8]

As a general rule, if an investment has a positive (+) profitability index (>1), then the project should be undertaken. However, if an investment has a negative (–) profitability index (<1), the project should be rejected.

- If PI > 1, Good Investment
- If PI < 1, Bad Investment

There exists a linear relationship between NPV and PI.

- If profitability index > 1, NPV is positive (+).
- If profitability index < 1, NPV is negative (–).

OBJECTIVES

Broad objective of the study is to do cost benefit analysis to understand the financial return of the eye center project. However, the specific objectives of the study are to:

1. Calculate the total year wise costs involved in the eye center.
2. Study the revenue pattern of the center through various procedures.
3. Calculate net present value and profitability index.

RESEARCH METHODOLOGY

The study is both descriptive and exploratory in nature. All the cost and revenue were taken from the audited finance records. A performa was made to identify different types of cost since hospital's inception. A separate sheet was prepared to calculate the year wise revenue from the patient and medical and consumable store.

The Present Value Concept

A project will be worth doing if the total of its benefits is at least as high as the sum of its costs, measured in monetary terms. Given that benefits and costs will continue over several years, and that the value of rupee today are worth more than the promise of rupees next year, both situation must be converted to a common time period, conventionally taken to be the present period. Accordingly, the net benefit of the project will be its net present value (NPV), defined as the present value of the benefits (PVB) less the present value of the costs (PVC). Net present value concept is a management tool to improve decision-making, taking. Discounting concept into account. The discounting part take cares the inflation while calculating present value for a project.

Profitability Index

Profitability is an important parameter (ratio) that explains the relationship between the costs of a project and benefits in terms revenue. The value of 1 is taken as minimum acceptable measure on this index.[7] Any value less than one, would indicate that the project's present value is lower than original investment. As the values of the profitability index (PI) increase, so does the financial return and worthiness of the proposed project. PI quantify the amount of value created per unit of investment. It is significantly different from return on investment which is used to evaluate the efficiency of an investment or to compare the efficiency of various investments options.

Data Collection Plan

The data used in the study was from 2010-2011 to 2016-2017. This includes actual and projected data. For the calculation purpose, year 2010 is considered as year zero. The data for the 0 to 3 years is the real time data. Remaining data is projected based on the trend seen from the actual data.

- 0 year initial investment
- 1 years: Oct 2010 to Mar 2011
- 2 years: Apr 2011 to Mar 2012
- 3 years: Apr 2012 to Mar 2013
- 4 years: Apr 2013 to Mar 2014
- 5 years: Apr 2014 to Mar 2015
- 6 years: Apr 2015 to Mar 2016
- 7 years: Mar 2016 to Apr 2017

The study is done based on the data collected or projected from 2010 to 2017. The main reason for taking these 7 years time frame is because of two facts, one that major equipments installed in the center were procured in the year 2013 and these equipments life is considered as 5 years. Secondly, the building is on lease agreement till 2017.

Data Analysis

Cost benefit analysis is done by calculating NPV and PI. Following formula is used to calculate both these indicators.

Net present value (NPV) = $_0\sum^n Rt/(1 + i)^t$

Rt = Net Gain or profit (total revenue-total cost)

i = Discount rate. It is taken as 10% in this study

n = No. of years

$$\text{Profitability index} = \frac{\text{NPV + Initial capital investment}}{\text{Initial capital investment}}$$

STUDY FINDINGS

Total expenditure year wise on the project, were divided into capital expenditure and running expenditure for different years. Capital expenditure includes cost of purchase of equipment, hospital information system (LEKHI), software licence, hardware costs and furnishing and other costs. Running expenditure includes the rent, cost of consumables, salary of the permanent employee and visiting consultants (Allocated Cost), petty cash for routine expenditure and yearly software licence renewal cost. Marketing expenses, staff and patient welfare expenses, travel expenses, phone bill, electricity bill, water bill and local vendor payment for supplies, repair and maintenance cost are included in petty cash. Total initial investment for the hospital in year zero is mentioned in Table 1. These costs are only the initial capital investment for the project.

The project was launched in the year 2010. Table 2 shows the year wise total costs incurred by the center under various heads. In the Table 2, cost from 2010-2011 to 2012-2013 are real time data and from 2013-2014 to 2016-2017 are the projected costs based on the trend seen in past 2 to 3 years. While making the projections, opinion of the promoters were also taken to understand if they have any immediate future investment plan. For making the calculation few assumptions were made, e.g. cost projections were made for the period 2013-2014 to 2016-2017 for different cost heads, e.g., consumables @ 15% increase annually, salary 15% increase annually and petty cash 25% annually. Rent and software renewal will remain same year as it is under long-term-agreement.

The revenue generating departments include OPD, cataract clinic, retina clinic, glaucoma clinic, Lasik clinic, occuloplasty services, squint clinic and pediatric eye services. The revenue is generated by performing diagnostic tests and carrying out surgeries in different clinics. Table 3 shows the year wise revenue generated by different specialties and the total revenue. It is observed from the Table 4 that from 2010 to 2013, revenue showed 20% increase annually and this is used as basis of revenue projections.

Graph 1 shows the graphical representation of the revenue pattern from 2010-2011 to 2016-2017.

Table 1: Capital investment in year zero

S. no.	*Capital expenditure*	*Rate (in ₹)*	*Amount (in ₹)*	*Share (%)*
1	Equipment (complete)		21950701	95.4
2	Lekhi Software (11 centers)	2000000	181818	0.8
3	Licence per center	200000	200000	0.9
4	Hardware cost	280000	280000	1.2
5	Furnishing and other cost	400000	400000	1.7
	Total		23012519	100

Table 2: Year-wise expenditure (actual and projected)

Year	*Consumables*	*Equipment*	*Software purchase*	*Salary*	*Rent*	*Software renewal*	*Petty cash*	*Total cost*
2010	–	23012519	–	–	–	–	–	–
2010-11	2472244	–	–	2991298	1500000	–	960000	7923542
2011-12	5686161	–	–	6879986	3000000	100000	2400000	18066147
2012-13	6539085	46000000	448333	7911984	3000000	100000	3000000	66999402
2013-14	7519948	–	–	9098781	3000000	100000	3750000	23468729
2014-15	8647940	–	–	10463598	3000000	100000	4687500	26899038
2015-16	9945131	–	–	12033138	3000000	100000	5859375	30937644
2016-17	11436901	–	–	13838109	3000000	100000	7324218	35699228

Total cost and total revenue is depicted in the Table 3. It shows that except for the years 2010 and 2012 to 2013, there is substantial net gain or profit. In these above-mentioned 2 years, cost is much higher than revenue due to heavy investment by the organization.

Net present value (NPV) for the project was calculated from 1 to 7 years based on the actual data of 3 years and projected data of subsequent 4 years. The NPV is calculated for the entire life cycle of the project but, in this case, we wanted to know the status of the project in the first 6 years of operation. After 2017, there may be expansion depending upon the performance of the center and market potential. Therefore, the NPV and PI for the project till 2017 are done to decide the future course of action.

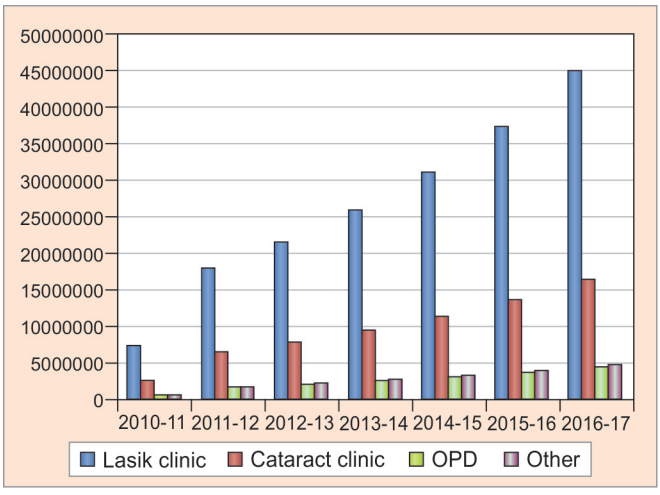
$$\text{Net present value (NPV)} = \frac{\text{Initial investment} + \text{Net gain}}{1 + 0.01^{n}}$$

$$\text{NPV} = 56918501$$

A positive NPV explain the project is worthwhile and making profits, with current cost and revenue projections. The project can be further being taken further and the promoters may look for more opportunity by expansion.

$$\text{Profitability index} = \frac{\text{NPV} + \text{initial capital investment}}{\text{Initial capital investment}}$$

PI for this center is 3.47 which shows that for every ₹ 1 spent, 3.47 rupees will be earned by the eye center.



Graph 1: Year-wise revenue generation trend from different specialities

Result of PI and NPV interpret that the project is viable and successful.

CONCLUSION

This research gives a unique and valuable insight toward the cost centers and revenue generation centers of the eye care unit. Cost centers include the capital cost, running cost and the petty cash. The revenue centers are the different specialties offered by the center and OPD, diagnostic tests and surgeries within the specialty. Also, the NPV and PI of the project are positive, i.e. the project is viable and profitable. For each rupee spent, the eye center earns approx ₹ 3.5.

Cost benefit analysis is one of the key items of any business case. It is the analysis of costs of a project that includes some consideration of both the cost and the pay-back in monetary terms. Measuring costs is an exacting process and relies upon clearly defining that the cost inputs selected for analysis are 'Measured in appropriate physical and natural units'.[4]

The PI is also known as benefit/cost ratio. It is present value of future values (NPV) plus the initial investment, divided by the initial investment. The NPV is a discounted cash flow (DCF) technique. It relies on the concept of opportunity cost to place a value on cash inflows arising from capital investment.

Opportunity cost is the calculation of what is sacrificed or foregone as a result of a particular decision. It is also referred to as the 'real' cost of taking some action. Present

Table 3: Year-wise cost, revenue and net gain or profit of the eye center

Year	*Total cost*	*Revenue*	*Net gain (profit)*
2010	23012519		–23012519
2010-11	7923542	11879180	3955638
2011-12	18066147	28510038	10443891
2012-13	66999402	34212044	–32787358
2013-14	23468729	41054454	17585725
2014-15	26899038	49265344	22366306
2015-16	30937644	59118414	28180770
2016-17	35699228	70942096	35242868

Table 4: Year-wise trend of revenue generation by different specialties

Year	*Lasik clinic*	*Cataract clinic*	*OPD*	*Others*	*Total revenue* (in ₹)	Data type
2010-11	7507643	2760721	794717	816099	11879180	Actual
2011-12	18018343	6625733	1907322	1958640	28510038	Actual
2012-13	21622012	7950879	2288786	2350367	34212044	Actual
2013-14	25946414	9541055	2746544	2820441	41054454	Projected
2014-15	31135697	11449266	3295852	3384529	49265344	Projected
2015-16	37362836	13739120	3955023	4061435	59118414	Projected
2016-17	44835404	16486943	4746027	4873722	70942096	Projected

value is the cash equivalent now of a sum receivable at a later date. If the money is not spent now and banked, the opportunity cost includes both the initial sum and the interest earned.

NPV is a technique where cash inflows expected in future years are discounted back to their present value. This is calculated by using a discount rate equivalent to the interest that would have been received on the sums, had the inflows been saved. A positive NPV means that the project is worthwhile because the cost of tying up capital is compensated for by the cash inflows that result. When more than one project is being appraised, the project with the highest NPV is taken up.

In this study, total costs and revenue data is analyzed to calculate the year wise net loss or net gain of the eye center. Total initial capital investment of the project is ₹ 23012519.18. Ninety-five percent of the initial capital investment is done on the equipment. Analysis of the cost centers data from 0 to 3 years revealed that petty cash, consumable cost and salary showed a 25, 15 and 15% increase respectively, on annual basis.

Analysis of the revenue of the 1 to 3 years showed that there is approximately 20% increase in the revenue every year. The analysis of 2012 to 2013 revenue data showed that Lasik clinic and cataract clinic contributed 63 and 23% of the total revenue generated in the year.

The center suffered a net loss in the 3rd year due to huge capital investment on equipment and software. For the rest of the years, the center shows net gain and is profitable.

Net present value calculated for the project for 7 years is 56918501. A positive NPV means that the cash flows will be positive. NPV is basically a tool to determine whether a decision or project of a firm will add value to it or not. When the NPV > 0, this means that the investment will add value to the firm and may be accepted. However, it must also be remembered while looking at the NPV that time is also a factor. In this case, the NPV for the eye center project is calculated based on the 7 years data so the NPV value tells that the project will be profitable at time 't' which is 7 years in this case.

When the present worth of all future cash flows exactly equals the initial investment, the NPV would be zero (because there is no rupee amount difference) whereas the PI would be 1.0 (because there is no proportionate difference). Profitability index measures the ratio between cash flow to investment. Therefore, the higher the ratio the more cash flows to investment. Profitability index = 1 means that the desired rate of return have been achieved (i.e. the price paid for the project based upon its future cash flows discounted at rate of return is exactly right). In case of our center, the PI is 3.47. It means that the center has exceeded its goal. For each penny spent, ₹ 3.47 will be the earned amount.

NPV reflects the net increase in firm's wealth and PI gives a ratio. In case of this eye center, both the NPV and PI are positive which means that the project is viable and is profitable.

LIMITATIONS

This study was based on actual data of two and a half years and projected data of 4 years. The outcome of the research could be more accurate and precise if there had been more actual data as compared to the projected data.

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REVIEW ARTICLE

Sexual Harassment: A Growing Concern for Women in Indian Healthcare Industry

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ABSTRACT

Centuries of development in the field of medicine, has been one among the many indispensable major factors behind India's sky-high growth and overall prosperity. Medicine has evolved itself from being just a subject of applied sciences at clinical level to become an industry occupied in constantly increasing the life-expectancy of the man kind. The Indian healthcare industry has been making an immense contribution in improving the quality of healthcare and ancillary services to the second largest populous country in the world, which shall continue only if every employee is secured from work-place crimes like sexual harassment. An employee is considered to be a victim of sexual harassment when he or she is mentally or/and physically pressurized against his or her will to get sexually exploited by a co-employee or a superior at his or her work-place. The Indian Penal Code along with several legislations governing the Indian healthcare industry have recognized the seriousness of 'sexual harassment at work-place', calling for an immediate attention from both legal and medical fraternity.

Keywords: Worker, Hospital, Patient, Sexual harassment.

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INTRODUCTION

Sexual harassment at work place is evident when a potential candidate for the employment or an employee is asked to resort to sexual acts or is demanded of being sexually exploited:

- for being chosen for the employment or
- when it becomes a pre-consideration for deciding the fate of his or her employment career.

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Equal Employment Opportunity Committee (EEOC) and the United Nations define 'sexual harassment' as follows:

'Unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature constitute sexual harassment when:

1. Submission to such conduct is made either explicitly or implicitly a term or condition of an individual's employment.
2. Submission to or rejection of such conduct by an individual is used as the basis for employment decisions affecting such individuals.
3. Such conduct has the purpose or effect of unreasonably interfering with an individual's work performance or creating an intimidating, hostile, or offensive working environment.'

The ambit for any act to come within the definition of 'sexual harassment'is wide enough to encompass any such behavior which in any manner trespasses into a person of an individual out raging his or her modesty. Some among many such acts are identified as below:

1. Improper physical contact and nonprofessional advances.
2. Abuse of one's dominance at work-place to demand sexual favors from subordinates/co-employees threatening of grave consequences on denial.
3. Sharing and playing of pornographic material (text/pictures/videos).
4. Sexual favors/demands sought by teaching or non-teaching (permanent or ad hoc) staff of medical college/institution from its students promising better grades/privileges.
5. Maintaining institutions or it's residence in a manner which by description is sexually explicit and morally-illicit further making its ambience nonconducive for academics, living or work.

MAGNITUDE OF PROBLEM

To obtain an understanding of women's experiences of sexual harassment in the health sector, an exploratory study was undertaken in 2005-2006 among 135 women health workers, including doctors, nurses, healthcare attendants, administrative and other nonmedical staff working in two government and two private hospitals in Kolkata, West

Bengal, India. Four types of experiences were reported by the 77 women who had experienced 128 incidents of sexual harassment:

- Verbal harassment (41)
- Psychological harassment (45)
- Sexual gestures and exposure (15)
- Unwanted touch (27)

None of the women reported rape, attempted rape or forced sex but a number of them knew of other women health workers who had experienced these. The women who had experienced harassment were reluctant to complain, fearing for their jobs or being stigmatized, and most were not aware of formal channels for redress. Experiences of sexual harassment reflected the obstacles posed by power imbalances and gender norms in empowering women to make a formal complaint, on the one hand, and receive redress on the other.[1]

A survey by the National Women's Commission reports that 46.58% of women report sexual harassment in the work place; only about 3.54% report the matter to authorities; 1.4% reported it to the police. In 2001, a five-state survey of workplace sexual harassment undertaken by Sakshi, a NGO in New Delhi, reported that 80% of the respondents said sexual harassment existed in their work place. Only 23% had heard of the Vishaka Guidelines; 66% of these said that the institutions had not effectively implemented these guidelines. When they had been implemented, redress seemed to be biased.

In a study conducted at one governmental and three private hospitals of Kaski district of Nepal Fifty four (40.30%) respondents have ever faced some form of sexual harassment, verbal harassment being the most common form. Sexual harassment was more frequent in the nurses of age group 20 to 29 years (62.96%) and in unmarried (59.25%). Physicians were the foremost perpetrators (37.03%) followed by patient's relatives (25.93%). Regarding the ways of coping or seeking help for harassment, just ignoring the situation was the main strategy. However, some of them shared the incidents with friends and told about it to the ward in charge. Most of the respondents believed that stronger security system and legalized channels for complaint mechanism in the hospital would be helpful to reduce the harassing behavior.[2]

Sexual harassment occurs in residency programs with alarming frequency. One survey revealed that 75% of residents in anesthesiology, family medicine, internal medicine, obstetrics-gynecology, pediatrics, psychiatry and surgery reported having experienced discrimination on the basis of sex.[3]

The most common forms of sexual harassment experienced by female residents included the telling of sexist jokes, compliments on body or figure, and flirtation. Unwanted sexual contact was experienced by 13% and explicit sexual propositions by 6.5%. Most of the responding female residents indicated that the sexual harassment was generated from a supervising physician. Fifty percent of residents experiencing sexual harassment stated that they told someone about it, most often another resident or friend. Only 23% of these residents reported it to a 14% were afraid to report sexual harassment because it would adversely affect their evaluations, and 13% believed that such reporting would not be kept confidential and might result in retribution or punishment.[5]

A more recent study[5] among Psychiatry, Internal medicine and Obstetrics-Gynecology residents also disclosed that sexual harassment and abuse are prevalent in medical training programs. Thirty-two percent reported that their physician supervisors told them inappropriate details of their private lives, 24% asked about details of the residents' private lives that made them feel uncomfortable, 12% touched them inappropriately, and nearly 8% asked them directly for a date. More than 31% of the residents reported that a supervisor unfairly favored another trainee because of a personal relationship with that trainee, and 25% of the trainees reported that a supervisor had dated a fellow trainee.

A survey of Argentinean residents disclosed that 10% were subjected to sexual harassment; attending physicians were the perpetrators of this harassment in 14% of the cases.[6]

In yet another study, 93% of women and 83% of men reported encountering sexual harassment during their residencies.[7]

Sexual harassment among medical students also occurs, although to a lesser extent. According to one survey, 15% of graduating US medical students experienced sexual harassment.[8] Three percent of students claimed that they were denied training opportunities because of sex rather than performance, and 2% reported experiencing unwanted sexual advances from school personnel. In still another survey of medical students,[9] 64% of female students and 21% of male students reported having experienced sexual harassment.

Finally, a study of medical students in Japan disclosed that 54% of female students and 15% of male students experienced sexual harassment.[10] Only 8% reported the abuse to authorities.

Thus it is evident that sexual harassment of healthcare personnel is a global pandemic and the studies revealed are just tip of the iceberg.

A 1994 survey of hospital has revealed that charges of sexual harassment within the healthcare industry are increasing at an alarming rate. Most charges are filed by women who claim they were victims of 'hostile environments.' Nurses levy the largest number of complaints, followed by clerical/secretarial personnel, technicians, custodial workers, food service personnel and therapists. Most

charges are filed against coworkers. Approximately, 10% of all charges of sexual harassment in hospitals are brought against physicians.[11,12] SH in the workplace has become an issue of increasing concern globally in the past decades.[1]

Hospital workers, who have to perform their daily routines with their coworkers, patients and patients' families, have been reported to experience more harassment than other categories of work.[14] Workers in hospitals who experienced SH easily suffer from emotional distress and unsafe feelings toward the workplace, and this might result in negative effects on the quality of patient care.[15,16]

BROAD TYPES OF SEXUAL HARASSMENT (SH)

There are two kinds of sexual harassment: quid pro quo and hostile environment.

Quid pro quo harassment (loosely translated as 'something for something') occurs when an employee is required to choose between submitting to sexual advances and losing a tangible job or educational benefit. This kind of harassment usually occurs between a supervisor and subordinate.

Hostile environment harassment is unwelcome conduct that is so severe or pervasive, it changes the conditions of the claimant's employment or educational situation and creates an intimidating, hostile, or offensive work environment. Hostile work environment harassment is not limited to sexual advances and includes sex-based actions such as display of sexually explicit materials, posters, pinups, and magazines.

Based on a hierarchical concept, SH has been categorized in sequence from mild (e.g. sex jokes or teasing remarks) to moderate (e.g. physical touch or repeated invitation) to severe (e.g. attempt to have sex). In general, the minor types of SH were more commonly seen than the severe ones, and sex jokes seemed to be the most prevalent type of SH in hospitals. Nevertheless, the recognition and perception of SH were also diverse between genders and different cultures.[17,18]

Sexual harassment shall also include:

- Stopping a vehicle and asking a female who is a stranger, if she wants a lift in the vehicle.
- Speaking to woman who is stranger and touching woman from passing vehicle.
- Cruising in vehicle looking for females to harass.
- Stopping and asking woman for directions with a view to harass her.
- Pursuing and stalking former girl-friends.
- Gossiping and spreading information about a woman's private life.
- Ridiculing a woman on the basis of her color, ethnicity, dress or physical appearance.

As to the issue of the perpetrators of SH, physicians and other coworkers have been reported as the most common source of SH. Some literature has also demonstrated that the most common perpetrators of all types of SH were patients, followed by doctors, other work colleagues and visitors or patient's relatives.[19,20]

For example, gender-related jokes could be perceived as either sexual humor or sexual harassment. It is an important issue when determining the subjective meanings of sexually related behavior to avoid unnecessary misunderstandings or potential lawsuits. As the majority of nurses are female in most countries, much of the related literature studies have investigated SH focusing on the female workers in hospitals. In recent years, there has been an increase in interest by investigators to analyze gender differences regarding SH among nurses.[21]

Sexual harassment in health care is a problem because of exorbitant legal costs, lost productivity, poor morale and nonproductive absenteeism or turnover. Sexual harassment has high prevalence in healthcare. Healthcare organizations often do little to prevent it and do not respond properly when it occurs. In most modern legal contexts, sexual harassment is illegal. Harassment can include 'sexual harassment' or unwelcome sexual advances, requests for sexual favors and other verbal or physical harassment of a sexual nature.[22] From various international studies, estimates of the annual prevalence rates of hospital staff who have experienced SH vary from 0.7 to 9.5%.[23] Empirically, nurses are the most vulnerable population to SH among hospital workers.[24,25]

Numerous studies have reported a high prevalence of SH among nurses during their careers, ranging from 30 to 97% . For female doctors, SH has also been commonly reported to be as high as 77% among family physicians, 58.3% among residents and 59% among medical students.[26-28]

In a previous study in Taiwan, the 1 year prevalence of SH was 9.5% among the workers in a psychiatric hospital. Except for nurses and doctors, there have been relatively few studies investigating SH among the other specialties of hospital staff.[29,30]

Sexual harassment may have a wide range of consequences.[31-33]

Emotional and psychological consequences: Many harassed employees reported feelings of mistrust, fear, anger and humiliation. In the Austrian national study 40% of the harassed women felt mistrust and 35% anger. Feelings of insecurity and helplessness were described by 1 in 10 of the respondents. The national Luxembourg study found that 9% of the employees complained about nervousness and depression and 19% have become distrustful.

Psychosomatic symptoms: The results of one of the Norwegian studies suggest that muscular pain, back and neck trouble were the consequence of sexual harassment. The Swedish national study showed that 18% of the

harassed women reported headaches and muscle aches, 16% experienced stress reactions such as palpitations and sleeping problems, 12% became depressed and 2% had considered suicide. The Swedish Metro study reported that the harassment had effected the health of the respondents: psychosomatic problems (25%), stress reactions (28%) and thoughts of suicide (4%).

Interference with private life: Some studies found that harassment interferes with the private lives of the employees. In the German national study 5% of the employees who had experienced sexual harassment also disliked sexual activities in their private lives. In the UK healthcare study 59% of the harassed employees reported an adverse effect on relationships with family and friends. The national UK study reported effects on an interpersonal level: tension in relationships (24%), feeling hostility toward others after experiencing sexual harassment (14%), withdrawal from contact with other people (9%), emotional detachment from those who are normally meaningful in your life (5%), and becoming repulsed by or afraid of touch (5%).

Effect on careers, jobs and working climate: In addition to consequences for the personal well-being of harassed workers, sexual harassment also negatively affects careers, the ability to work, the working climate and motivation.

Effect on careers and jobs: It appears that a considerable proportion of harassed employees leave their jobs, either by giving notice or by taking leave of absence or sick leave. Also frequently reported are a change of workplace or being fired. The Swedish national survey and the Belgian secretary study reported an overall figure for professional consequences of around 30%. The Swedish survey reported various negative impacts: reduction in duties; less remuneration; higher demands on work performance; unreasonable criticism; and isolation. According to the Norwegian several branches study (Moland, 1997), sexual harassment had a negative impact on sick leave: harassed persons were ill twice as often as their colleagues.

Factors affecting the ability to work: One of the national studies examined consequences of sexual harassment that affected the employees' ability to work. The UK study found that 24% of harasses experienced difficulty in thinking clearly as a consequence of being harassed, 18% reported an inability to concentrate, 11% indicated a decrease in productivity, and 13% claimed to have experienced interference with their problem-solving abilities and judgement.

Consequences for the working climate and motivation of the employees: Sexual harassment affects the working climate and motivation of employees. In the Finnish qualitative research (Varsa, 1993), many women reported that harassment called their professional qualifications into question. The Finnish University study stated that staff members felt isolated from their colleagues, thought that they had received unjust criticism from their colleagues for complaining about sexual harassment, and, consequently, their work motivation decreased. The Swedish University study reported also negative consequences for the working climate: isolation (17%), spreading of rumors (10%) and uneasiness at going to work (17%), unwarranted criticism, and change for the worse in working condition. One Norwegian several branches study (Einarsen, 1993) found that women with sexual harassment experiences were more negative about their working climate. One of the German several branches studies showed that women who had experienced sexual harassment were less satisfied with and felt more indifferent about their work. The Austrian 'training on the job study' reported that 50% of the harassed women had less joy in their occupation.

LAWS PREVENTING SEXUAL HARASSMENT IN INDIA

Since the victims of 'sexual harassment' in India are predominantly women, their safety is a matter of very high concern. The Constitution of India bestows upon its citizens with fundamental rights through its Articles 14, 15 and 21 under Part III, which unconditionally protects women from all sorts of discrimination or victimization and guarantees a safe environment free from 'sexual harassment' to exercise her fundamental right to practice/profess/carry out any profession/occupation/trade/business throughout India.

To counter the rising menace of 'sexual harassment' and in-order to encourage more number of women to feel safe at work-place, it became crucial to enact a special legislation addressing this concern. Accordingly 'The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act 2013' (hereinafter referred as 'SHWA 2013') received the assent of the Indian President on 22nd April 2013 and has come into effect from 9th December 2013 onward.

Section 3 of the very SHWA 2013 is reproduced hereunder:

'Section 3 (1) No woman shall be subjected to sexual harassment at any work place.

(2) The following circumstances, among other circumstances, if it occurs or is present in relation to or connected with any act or behavior of sexual harassment may amount to sexual harassment:

i. Implied or explicit promise of preferential treatment in her employment.
ii. Implied or explicit threat of detrimental treatment in her employment.
iii. Implied or explicit threat about her present or future employment status.
iv. Interference with her work or creating an intimidating or offensive or hostile work environment for her.

v. Humiliating treatment likely to affect her health or safety.'

Chapter II of the SHWA 2013 makes it mandatory for every employer of a workplace [Section 2(o)iii of SHWA 2013 determines 'hospitals or nursing homes' as 'workplace'] to constitute an 'Internal Complaints Committee' and Chapter III allows the state governments to establish 'Local Complaints Committee' in every District to meet the objectives of this act.

Section 9 in the very Act, requires the woman who is sexually harassed at workplace to make/file a written complaint to the Internal or Local Complaints Committee within 3 months from the date of the incident. If neither of these Committees is established then the complaint can be made directly to either District Magistrate/Additional District Magistrate or local Police (in accordance with the Criminal Procedure Code 1973). In case of delay beyond 3 months, the reasons causing such a delay shall be considered and reasoned by both the aforementioned committees before allowing the complaint. Such a complaint shall attract Sections 354 and 509 of the Indian Penal Code 1860 amounting to allegations against cognizable offences empowering the police to initiate investigation without any delay. SHWA 2013 has empowered the Internal and the Local Committee with the powers of a civil court (as under Code of Civil Procedure, 1973) to conduct the inquiry in accordance with applicable service rules of the workplace (Service rules/standing orders vary between Industries and Hospitals). Section 11 and Section 13 necessitates the committees to complete the inquiry proceedings within 90 days and submit the final report to the employer within 10 days from the date of completion of the inquiry proceedings. Section 13(3)ii of SHWA 2013 prescribes monetary compensation to the women victim computed on the basis of Section 15 reproduced below:

'Section 15: For the purpose of determining the sums to be paid to the aggrieved women under clause (ii) of sub-section (3) of Section 13, the Internal Committee or the Local Committee, as the case may be, shall have regard to:

a. The mental trauma, pain, suffering and emotional distress caused to the aggrieved women.
b. The loss in the career opportunity due to the incident of sexual harassment.
c. Medical expenses incurred by the victim for physical or psychiatric treatment.
d. The income and financial status of the respondent.
e. Feasibility of such payment in lumpsum or in instalments.'

Chapter VI of SHWA 2013 makes it mandatory for every employer in the health industry to comply by Section 19 in order to create a safer work environment for women at her workplace. Section 19 under Chapter IV of SHWA 2013 is reproduced herein below:

'Section 19: Every employer shall:

a. Provide a safe working environment at the workplace which shall include safety from the persons coming into contact at the workplace.
b. Display at any conspicuous place in the workplace, the penal consequences of sexual harassments; and the order constituting the Internal Committee under subsection (1) of Section 4.
c. Organize workshops and awareness programs at regular intervals for sensitising the employees with the provisions of the Act and orientation programs for the members of the Internal Committee in the manner as may be prescribed.
d. Provide necessary facilities to the Internal Committee or the Local Committee, as the case may be, for dealing with the complaint and conducting an inquiry.
e. Assist in securing attendance of respondent and witnesses before the Internal Committee or the Local Committee, as the case may be.
f. Make available such information to the Internal Committee or the Local Committee, as the case may be, as it may require having regard to the complaint made under sub-section (1) of Section 9.
g. Provide assistance to the woman if she so chooses to file a complaint in relation to the offence under the Indian Penal Code or any other law for the time being in force.
h. Cause to initiate action, under the Indian Penal Code or any other law for the time being in force, against the perpetrator, or if the aggrieved woman so desires, where the perpetrator is not an employee, in the workplace at which the incident of sexual harassment took place.
i. Treat sexual harassment as a misconduct under the service rules and initiate action for such misconduct.
j. Monitor the timely submission of reports by the internal committee.

If redefined on the basis of the discussions made so far then sexual harassment is a form of sex discrimination evident through unwelcome sexual advances including request for sexual favors and other verbal or physical conduct with sexual overtones, either directly or by implication, particularly when submission to or rejection of such a conduct by the female employee is capable of being used for effecting the employment of the female employee and unreasonably interfering with her work performance. Non-cooperation by such an employee toward sexual advances or requests might also go on to create an intimidating or a hostile working environment for her. Sexual harassment at workplace is nothing but a gross violation of the Fundament al Rights to Gender Equality, Life and Liberty, guaranteed

to every individual by the Constitution of India. The contents of the fundamental rights guaranteed by the Indian Constitution are of sufficient amplitude to encompass all the facets of gender equality, including prevention of sexual harassment and abuse and the courts are under a constitutional obligation to protect and preserve those fundamental rights for every individual especially women.

Protection against 'sexual harassment' and the 'right to work with dignity' are universally recognized human rights by international conventions and instruments such as 'Convention on the Elimination of all forms of Discrimination against Women', which has been ratified on the 25th June 1993 by the Government of India. Beijing Declaration directs all the State parties to take appropriate measures to prevent discrimination of all forms against women besides taking steps to protect the honor and dignity of women is loud and clear.

During the ILO Seminar of 1993, held at Manila, sexual harassment at work place was recognized as a form of gender discrimination against woman.

'The International Covenant on Economic, Social and Cultural Rights' contains several provisions for welfare and protection of women. Article 7 of the Covenant recognises her right to fair conditions of work and prohibits sexual harassment of women at workplace ensuring environment at the place of work remains conducive for women to work. These international instruments cast an obligation on the Indian State to gender sensitize its laws and thereby the Courts are under an obligation to uphold the objective of these international instruments.

It is mandatory for a registered medical practitioner/ professional to abide by The Indian Medical Council (Professional conduct, Etiquette and Ethics) Regulations, 2002, which forms part of the declaration, on the undertaking of which alone a doctor is permitted to practice. As per the very Regulations of 2002:

- A physician is obligated to maintain an image of an upright person and uphold the ideals, dignity and honour of the medical profession.
- Any such act or behavior by a medical professional which constitutes a sexual offence like sexual harassment or adultery is a grave misconduct calling for a strict disciplinary action under Chapter 7 of the Regulations of 2002.
- Chapter 8 of the Regulations of 2002 prescribes appropriate punishment and stern disciplinary action against any medical practitioner whose misconduct is proved under the very Regulations of 2002, by the inquiry initiated from the complaint made to the medical council.'

Vishaka Guidelines: In 1997, the Supreme Court of India in a Public Interest Litigation, defined sexual harassment at workplace, preventive measures and redressal mechanism. The judgement is popularly known as Vishaka Judgement.[32]

It was in 1997 in Vishaka *vs* State of Rajasthan and others, that for the first time sexual harassment had been explicitly-legally defined as an unwelcome sexual gesture or behavior whether directly or indirectly as:

a. Sexually colored remarks
b. Physical contact and advances
c. Showing pornography
d. A demand or request for sexual favors
e. Any other unwelcome physical, verbal/nonverbal conduct being sexual in nature.

It was in this landmark case that the sexual harassment was identified as a separate illegal behavior. The critical factor in sexual harassment is the unwelcomeness of the behavior. There by making the impact of such actions on the recipient more relevant rather than intent of the perpetrator which is to be considered.

Preventive Steps

All employers or persons in charge of work place whether in the public or private sector should take appropriate steps to prevent sexual harassment. Without prejudice to the generality of this obligation they should take the following steps:

a. Express prohibition of sexual harassment as defined above at the work place should be notified, published and circulated in appropriate ways.
b. The rules/regulations of Government and Public Sector bodies relating to conduct and discipline should include rules/regulations prohibiting sexual harassment and provide for appropriate penalties in such rules against the offender.
c As regards private employers steps should be taken to include the aforesaid prohibitions in the standing orders under the Industrial Employment (Standing Orders) Act, 1946.
d. Appropriate work conditions should be provided in respect of work, leisure, health and hygiene to further ensure that there is no hostile environment toward women at work places and no employee woman should have reasonable grounds to believe that she is disadvantaged in connection with her employment.

Criminal Proceedings

Where such conduct amounts to a specific offence under the Indian Penal Code or under any other law, the employer shall initiate appropriate action in accordance with law by making a complaint with the appropriate authority. In particular, it should ensure that victims or witnesses are not victimized

or discriminated against while dealing with complaints of sexual harassment. The victims of sexual harassment should have the option to seek transfer of the perpetrator or their own transfer.

Disciplinary Action

Where such conduct amounts to misconduct in employment as defined by the relevant service rules, appropriate disciplinary action should be initiated by the employer in accordance with those rules.

Complaint Mechanism

Whether or not such conduct constitutes an offence under law or a breach of the service rules, an appropriate complaint mechanism should be created in the employer's organization for redress of the complaint made by the victim. Such complaint mechanism should ensure time bound treatment of complaints.

Complaints Committee

The complaint mechanism, referred to as in above, should be adequate to provide, where necessary, Complaints Committee, a special counsellor or other support service, including the maintenance of confidentiality.

The Complaints Committee should be headed by a woman and not less than half of its member should be women. Further, to prevent the possibility of any undue pressure or influence from senior levels, such Complaints Committee should involve a third party, either NGO or other body who is familiar with the issue of sexual harassment. The Complaints Committee must make an annual report to the Government department concerned of the complaints and action taken by them.[33]

Workers Initiative

Employees should be allowed to raise issues sexual harassment at workers meeting and in other appropriate forum and it should be affirmatively discussed in Employer-Employee Meetings.

Awareness

Awareness of the rights of female employees in this regard should be created in particular by prominently notifying the guidelines (and appropriate legislation when enacted on the subject) in a suitable manner.

Third Party Harassment

Where sexual harassment occurs as a result of an act or omission by any third party or outsider, the employer and person in charge will take all steps necessary and reasonable to assist the affected person in terms of support and preventive action.

HANDLING FALSE CHARGES

A legislative instrument of this kind is amenable to misuse. The person against whom charges have been made goes through enough trauma and social ostracism during the tenure of enquiry. So the section 14 of the law makes it clear that if anyone makes a 'malicious' or false complaint or produce any misleading document that will attract punishment. Such action on the complainant will have to be taken only after establishing her malicious intent through an inquiry. The provision shows a prudent balancing approach between the aggrieved and the respondent. A mere inability to substantiate a complaint or provide adequate proof need not attract punitive action. So the fear of misuse of the provision need not deter a woman from making a complaint.

However there is a growing tendency among people to avoid any negative publicity of being indifferent to sexual harassment which may indirectly influence the committee /employer to propose/take disciplinary action regardless of what the investigation revealed or whether any misconduct actually had occurred.

The case can be registered under section 507 (criminal intimidation) and 354D (sexual harassment) in these issues.

The Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

The Act has identified sexual harassment as a violation of the fundamental rights of a woman to equality under articles 14 and 15 of the Constitution of India and her right to life and to live with dignity under article 21 of the Constitution; as well as the right to practice any profession or to carry on any occupation, trade or business which includes a right to a safe environment free from sexual harassment. The Act also states that the protection against sexual harassment and the right to work with dignity are universally recognized human rights by international conventions and instruments such as Convention on the Elimination of all Forms of Discrimination against Women, which has been ratified on the 25th June, 1993 by the Government of India. This Act entails:

- The Act defines sexual harassment at the work place and creates a mechanism for redressal of complaints. It also provides safeguards against false or malicious charges.
- The definition of 'aggrieved woman', who will get protection under the Act is extremely wide to cover all women, irrespective of her age or employment status, whether in the organized or unorganized sectors, public or private and covers clients, customers and domestic workers as well.

- While the 'workplace' in the Vishaka Guidelines is confined to the traditional office set-up where there is a clear employer-employee relationship, the Act goes much further to include organizations, department, office, branch unit, etc. in the public and private sector, organized and unorganized, hospitals, nursing homes, educational institutions, sports institutes, stadiums, sports complex and any place visited by the employee during the course of employment including the transportation.
- The Committee is required to complete the inquiry within a time period of 90 days. On completion of the inquiry, the report will be sent to the employer or the District Officer, as the case may be, they are mandated to take action on the report within 60 days.
- Every employer is required to constitute an Internal Complaints Committee at each office or branch with 10 or more employees. The District Officer is required to constitute a Local Complaints Committee at each district, and if required at the block level.
- The Complaints Committees have the powers of civil courts for gathering evidence.
- The Complaints Committees are required to provide for conciliation before initiating an inquiry, if requested by the complainant.
- Penalties have been prescribed for employers. Noncompliance with the provisions of the Act shall be punishable with a fine of up to ₹ 50,000. Repeated violations may lead to higher penalties and cancellation of licence or registration to conduct business.

Do's

- Ensure that a harassment/ sexual harassment policy is in place
- Respond quickly and seriously to any complaint of harassment
- Arrange for an independent investigation
- Ensure that the respondent is provided with full information regarding the complaint
- Provide an opportunity for both the complainant and the respondent to be present their version of the events
- Keep the process confidential
- Emphasize to all witnesses that they will be protected from any retaliation regarding their evidence
- Obtain written statements or take careful notes of all interviews
- Document, in writing, the process followed as well as the results of the investigation
- Discuss the results individually with the complainant and the respondent
- Consider providing a final opportunity for the respondent to respond to any written report of the investigator's findings or recommendations, particularly where discipline may be imposed
- Formalize and publicize complaints procedures that are easy and nonthreatening
- Provide safety for friends and supporters of complainant.
- Appoint complaints officers—one man and one woman —to serve as first point of contact
- Authorize complaints officers to resolve the issue without the committee's intervention
- Use a cheerful, comfortable, airy room for meeting the complainant
- Ensure that your body language communicates complete attention to the complainant and accused
- Treat the complainant with respect
- Discard predetermined notions of how a victim or accused should look or behave. Beware of stereotypes
- Do remember that women have the following fundamental rights under constitution:
  - Right to Gender equality Right against discrimination on grounds of sex
  - Right to practice any profession or to carry out any occupation, trade or business
  - Right to Life and Liberty.

Don'ts

- Do not under any circumstances get aggressive
- Do not insist on a detailed description of harassment
- Do not allow for interruptions when talking to the complainant and/or accused
- Do not try and determine the impact of the harassment on the complainant
- Do not discuss the complaint among yourselves in the presence of the complainant or accused
- Do not infringe the fundamental rights of women, as they are enforceable under Article 32 of the Constitution and hence, attract legal action
- Do not forget to show due courtesies toward female employees and colleagues
- Do not ever pass sexually colored remarks on woman employees
- Do not ever indulge in any unwelcome physical, verbal or nonverbal conduct of a sexual nature with any woman employee
- Do not place women employees at disadvantageous position in connection with their employment.

CONCLUSION

Sexual harassment in the workplace though an age-old problem, still exists as a serious concern and an important

and widespread problem particularly in health sector. Appropriate preventive, control and remedial measures supported by legislative measures is essential to address the concerned issue.

All medical and educational facilities should have a written sexual harassment policy in place. The policy should be made known to all personnel and affirm that the facility will not tolerate sexual harassment, will promote an environment free of such harassment, and will take disciplinary action when such harassment is discovered. The policy should also include a definition of sexual harassment, preferably including examples of behavior that does or does not constitute sexual harassment.

Policies, sanctions, accountability, training, the type of investigations and changed organizational culture help reduce sexual harassment. It is imperative that reduction of sexual harassment in healthcare is important because it is a major social issue.

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REVIEW ARTICLE

Planning Premises and Design Considerations for Hybrid Operating Room

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ABSTRACT

The hybrid operating room can be defined as the combination of imaging system and operating table installed in an operating theater room for, e.g. use of an angiography imaging system and operation table in an operation theatre or use of an operating table in angiography room. Shorter patient recovery time, decreased length of stay, streamlined care delivery, improvement in cross-specialty communication, minimized risk for communication-related errors across clinical specialties and lower overall cost of care are some of the advantages of the hybrid operating room. Although no/limited data exists in the literature, the potential disadvantages of hybrid operating suite are cost, infection, prolonged anesthesia and radiation exposure. The primary components of a hybrid operating suite are an imaging system and imaging compatible operation table. Area required for hybrid operating suite varies from 80 to 150 m^2. The most common configuration of hybrid operating suite includes a flat panel angiographic X-ray imaging system and surgical equipment for cardiac surgery.

Keywords: Operating room, Hybrid operation room, Intra-operative imaging.

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INTRODUCTION

In recent years, we have seen 'winds of change', in medical science and nowhere can this be more aptly applied than in the great changes that have developed in regard to the construction, and organization, of the modern operating theater suite.[1] 'OT has been defined as that specialized facility of the hospital where lifesaving or life improving procedures are carried out on the human body by invasive methods under strict aseptic conditions in a controlled environment by specially trained personnel to promote healing and cure with maximum safety, comfort and economy'.[2]

Imaging has a long history in the operating room (OR). In the 1960s, X-ray units were mounted on the ceiling, as they might be today. But the surgeon had to go to an adjacent room to view the image, and images could only be stored for 10 minutes. Mobile C-arms, introduced in the late 1960s, have been a mainstay of OR imaging. But more hospitals are finding these C-arms are no longer meeting their OR imaging needs. Increasingly complex surgical and interventional approaches require more advanced imaging. In response, many larger facilities have replaced the conventional OR configuration with new configurations known as hybrid ORs. The word 'Hybrid' originally refers to the result of interbreeding between plants or animals of two different species. These combine surgical equipment and instrumentation for open procedures with a fixed and dedicated imaging system as well as an imaging-compatible surgical table, lights, and surgical booms to accommodate open, minimally invasive and interventional procedures.[3] It can function as either a conventional operating theater, or as a radiology facility, but crucially allows intra- and postoperative on-table imaging and intervention, and overcomes many of the limitations of standard facilities.

Need for Hybrid OR

The introduction and rapid growth of minimally invasive surgery (MIS) has stimulated interest in OR design. Hospitals and surgi-centers have been inundated with requests for construction and renovations to facilitate the practice of MIS. Other surgical disciplines and endoscopic environments also recognized the potential to create a procedural environment that would better meet their specific needs.[4]

Trends are driving the need for more imaging in the OR because of following reasons:

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- A growing aging population means more people are living longer to require surgery best performed with image guidance.
- More than 60% of all patients having surgical procedures are overweight or obese and often have comorbid diabetes and cardiovascular disease.

These trends increase the likelihood of more complications during interventional procedures, often leading to the need to convert to an open surgical procedure[3] and moreover:

- The lines between interventional and surgical specialties are blurring—interventional procedures are becoming more complex, and surgical procedures are becoming less invasive.
- Increasing numbers of patients with complex disease are forcing cardiac surgeons and interventional cardiologists to collaborate more frequently.

More complex procedures in the interventional suite mean patients will require more clinical supervision and possibly a more intense level of care. This has been an important factor in shift from conventional operation theaters toward integrated and hybrid operating theaters. Following table describes the advantages and disadvantages of hybrid operating room (Table 1).

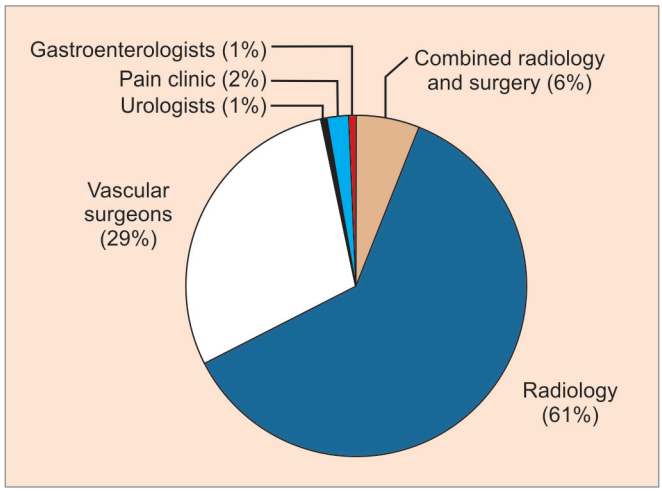
Procedures Which can be performed in Hybrid Operating Theater

Because of its versatile nature it can be used by various clinical specialities mainly for endovascular surgery, interventional radiology, open vascular surgery, open surgical and radiological procedures (Graph 1).[5]

Planning and Design Challenges

Following are the challenges associated with designing of hybrid operating room:

1. Multiple stakeholders
2. Required space
3. Co-ordination with multiple vendors



Graph 1: To demonstrate multispecialty usage of the hybrid theater[5]

   a. Lighting
   b. Monitors and video switching
   c. X-ray/imaging system
   d. Other OR requirement
4. Radiation safety
5. Capital cost.

Planning for Hybrid OR

From the outset, it should be recognized that effective design of a hybrid operating suite is a complex process which in most cases will require at least 6 months to over a year. The operating theater suite must be so well designed and so attractively set out, that not only will the work done there be of the highest order, but the personnel engaged therein, will find it a real pleasure to work in such ideal surroundings. Fatigue will be minimal, boredom nonexistent, efficiency at its highest peak, and pride of achievement the driving force.[1]

Before planning a hybrid operating room, a clear vision for the utilization should be established. Planning of the hybrid room is truly an interdisciplinary task. It involves much more co-ordination and multiple departmental involvements than planning for a conventional OR or

Table 1: Advantages and disadvantages of hybrid OR[3,6]

Advantages	*Disadvantages*
Shorter patient recovery time	Cost
Decreased length of stay	Infection risk
Streamlined delivery of care	Prolonged general anesthetic
Overall lower cost of care	Prolonged radiation exposure
Potential for revenue growth	
Minimized risk for communication-related errors across clinical specialties	
Effectiveness and efficiency in training, teaching and research	
High quality imaging vastly superior to portable systems	
Promotes the multidisciplinary process and allows for efficient use of staff and equipment	

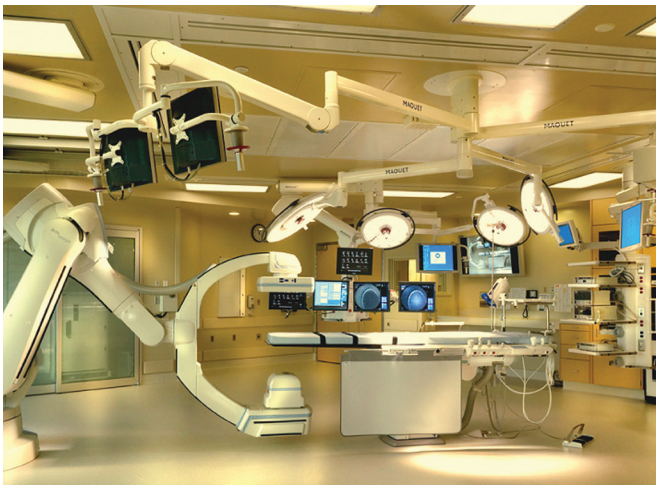


Fig. 1: Hybrid operating room (Providence Sacred Heart Medical Centre)[11]

catheterization laboratory alone. These rooms are used not only by surgeons and interventional cardiologists, but also by electro physiologists, neurosurgeons, and cardio thoracic vascular surgeons.[7]

Visits to established hybrid operating rooms, and discussions with experienced users help tremendously during the planning process. Key stakeholders need to be identified and for planning should be included at an early stage.

In most cases, the design team will be led by a vascular surgeon. In many cases, cardiac thoracic vascular surgery will also be interested and involved in the process of development of this suite. The multidisciplinary planning should have representation from hospital administration, anesthesiology, cardiology, neuroradiology, radiology, surgery, nursing staff, architects, engineering and radiology technologists who will be running the imaging equipment.[8] Any specialty that would be using the OR needs to be involved in the planning. It is good to include the OR and catheterization laboratory equipment vendors chosen for the project so they can coordinate.

As each of these stake holders will be involved in the administration or actual procedures performed in the room, initial input is essential to prevent subsequent design flaws and friction. The construction of a hybrid suite requires a deep understanding of the technology and its implication for the surgical workflow.

Hybrid Operating Suite – Design Considerations

The primary components of the hybrid operating suite is imaging system as well as carefully designed operating tables to accommodate and optimize the usefulness of the radiographic equipment (Fig. 1).[9]

As such, conversion of established ORs to hybrid operating suites is usually not possible. A combination of two rooms or an OR with an adjacent storage space may be possible but clearly in the absence of new construction, creation of such a space in an established operating room can present considerable challenges.[8] The expense of these constructions and modifications can vary up to $100,000 depending on the original condition of the room, local contracting costs, architect's fees and companies that market fixed imaging systems.[9]

Location

The following things should be considered while deciding on the location of hybrid OR:[10]

- Relative ease of access to/from emergency department, radiology department, intensive care unit (ICU), inpatient beds, etc.
- Proximity to blood bank, labs, pharmacy, etc.
- Materials Support
  - Supply restock support
  - Standardize inventory
  - Mobile or stationary storage.
- Flow management
  - Ease of patient entry/exit
  - Away from heavy traffic areas for sterility reasons.
- Adequate electrical service to support new imaging equipment.

Size

The size of the hybrid room should be able to accommodate:[11]

- Larger teams with additional diagnostic, imaging and surgical experts
- Additional equipment around 'typical' surgery equipment
- Provide image equipment control (sometimes with dedicated technicians) and storage areas outside of the OR itself
- Provide dedicated equipment support areas, some with their own temperature and air demands
- Allow mobility of equipment, as cost and use often require equipment to be shared between rooms
- Provide flexibility in equipment location and allow for unspecified future possibilities.

Usually a hybrid operating theater (OT) can be divided into various areas which includes procedure room of 80 m^2, equipment room of 10 m^2 and control room of 12 m^2.[10] The OR should ideally be between 60 and 150 m^2 with a minimum clear area of 40 to 50 m^2.[12] Another study says that OR should be between 55 and 90 m^2, with a minimum clear area of 40 to 50 m^2.[9] Floor to ceiling height should be at minimum 10 feet to accommodate floor- or ceiling-mounted C-arms capable of rotational angiography.[9,12] Space for stor-

age for the special procedure related equipment should be approximately 20 to 50 m^2.[10]

Radiation Protection

The facility should be designed considering applicable laws, rules and regulations pertaining to radiation protection as the equipment utilized in hybrid operating suite can emit radiation. The walls of the hybrid OR requires lead lining to limit radiation exposure.[11] Radiation exposure can be divided into exposure of the patient and exposure of personnel. It varies greatly between different procedures and is dependent on multiple factors.[13]

Most standard ORs have leaded covering 0.5 mm which is not sufficient for the radiation dose generated by a fixed unit. Lead-lined walls in the range of 2 to 3 mm for the fixed units may be needed.[9,12] In addition, ceiling-mounted transparent shields are available for optimal scatter protection of the operator's upper body and face. Moreover, the newer portable C-arm units are less restricted as to the energy they can deliver, compared to fixed systems. This implies an increasing imaging quality, but the boost setting on these units delivers radiation doses with intense scattered radiation.[14]

Operation Table

Electronic integration of the table with the imaging system is essential to prevent collisions and to allow maximal capability of the imaging system.[8] The preferred surgical operating table to accommodate such techniques should be preferably thin but highly stable and should provide complete clearance beneath a panning X-ray system.[15] While many hospitals have adopted the use of mobile imaging tables with various levels of functionality (such as floating table tops), these tables are not satisfactory for modern imaging systems.[8,16] The choice can be made between two fully integrated table systems. First, an operating table with a floating table top. Second, a conventional OR table system with two different, exchangeable table tops — a radiolucent one-piece carbon table top and a breakable table top.

Advantages of a carbon fiber table include reduction of radiation, improvement of the imaging quality and reduction of the radiation burden to personnel. When choosing for fixed carbon fiber table that can be controlled by a table-side console, one should realize that these tables are broad and therefore working in the groin area and at the lower extremities may be awkward. Patient transfers are less convenient using these broad tables. Modern tables, however, have a table top that can be moved longitudinally, away from the broad part, over such a distance that the patient easily is accessible. This requires sufficient space in the operation room, and anticipation when placing anesthetic equipment. Furthermore, one should realize that these 'radiologic' tables are not supplied with side bars on the narrow part; these are useful for connection of retractor systems or armrests.[14]

Finally, although an operation table that could bend in the middle would be useful, especially for hybrid procedures, such constructions can only be built by using metal nonradiopaque articulations, which are not available commercially. As a result, until now only two planes of tilt, craniocaudal and lateral have been possible.[14]

Flat Screens and Monitors

The hybrid suite must be equipped for continuous patient monitoring. A total of four to six ceiling-mounted flat screens as imaging tools for the procedures are necessary. Extreme care should be taken to ensure that these ceiling-mounted flat screens do not collide with operating lights. Monitors for the vital signs of the patient with provision for systemic arterial monitoring, central venous monitoring and continuous electrocardiographic surveillance is imperative. A large 40 to 56 inch flat panel should be available as well as cameras (wall/or in-light).[12]

Audiovisual Systems

Increased imaging requirements require an integrated audiovisual channeling system to allow various images to be moved to be different monitors throughout the room. For example, the ability to bring PACS system images (stores X-ray images) up to the operating table for review at the time of surgery is a useful adjunct as is the ability to bring the patient's physiologic information up to the surgeon's monitor if necessary. A variety of commercial systems are available to facilitate image routing throughout the operating room suite.[8]

Imaging Technology

The most common configuration includes a flat-panel angiographic X-ray imaging system and surgical equipment for open cardiac surgery. The second most common configuration is for interventional and surgical neuroapplications, although only a few hospitals have installed dedicated neuro-hybrid ORs.[3] Imaging technology can include:

- Single-plane or biplane flat panel angiographic X-ray imaging system
- 3D rotational angiography
- Computed tomography scanning
- Intravascular ultrasound
- Duplex ultrasound
- 3D transesophageal echocardiogram

- Magnetic resonance imaging
- Integrated robotic surgery
- Large, up to 83 inch image intensifiers.

Equipment's in Hybrid Operating Room

Equipment that may be installed in a hybrid OR (list not inclusive):[3]

- Surgical lights
- Surgical table
- Surgical (endoscopy) video systems
- Surgical booms
- Anesthesia system
- Robotic surgery system
- Magnetic catheter navigation system
- Heart-lung bypass system
- Intravascular and/or cardiac ultrasound system
- Operating microscope
- Neurosurgical navigation system.

Image Acquisition and Display[12]

In CT rotational angiography, which the latest hybrid imaging systems have, the C-arm is used to rapidly rotate, obtaining serial images of the area in question in a radial fashion. The 3D reconstruction can be registered with subsequent real-time fluoroscopic images and projected to offer the clinician the ability to work in three dimensions. Data can be rendered volumetrically and overlayed on the fluoroscopic image, making the anatomy much more identifiable, a fused 2D/3D dataset can be created, or the information can be placed side by side. Further requirements of the suite's imaging system are a processing unit, a workstation, and a central image storage unit. The potential of any C-arm equals the weakest link of each of these last three elements. While performing a procedure, smooth and fast graphic abilities are a must. Using large-size, superb-quality images from a C-arm implies that a powerful processing unit is needed.

Images from a C-arm are stored in DICOM format files, which can then be used for biometric post processing, such as quantitative vessel analysis or 3D reconstruction. The higher the quality of the images obtained from the C-arm, the larger the size of the files that have to be processed by the workstation.

Sterility Issues

In order to guarantee highest flexibility in room usage, hospitals tend to equip all operating rooms according to the highest design standards which should include a laminar air flow ceiling. Some hospitals even require skirts around the laminar air flow field and this setup may preclude ceiling-mounted systems. In any case, ceiling-mounted systems with running parts above the operating field, which are difficult to clean and interfere with the air flow by causing turbulences, are least recommended from a hygienic stand point.[12] It is very important to maintain sterility by having an effective HVAC system with well-developed pressure gradient especially in cases of intraoperative MRI (same machine can be utilized by radiology department).

Hybrid OR with Intraoperative CT

The system consists of a radiolucent adjustable, flexible, rotating operating table, an initially mobile and later ceiling-mounted frameless infrared-based neurosurgery navigation system (NNS), and a commercially available latest generation 40-multislice CT scanner with a sliding gantry and enlarged bore diameter of 82 cm. The CT scanner is directly connected to the NNS, which allow automated referencing after data transfer. To increase patient safety, a sliding gantry concept is implemented that allows the operating table to remain in a stable position during imaging with the gantry moving over the radiolucent surgical table. The carbon- made OR table allows the patient to be placed in any position including prone, supine, park bench and sitting. Scanning is possible in all positions except sitting. The scanner is controlled by a workstation in a room next to the OR with direct visual contact and video surveillance. This setting enables CT image acquisition without any radiation exposure to personnel because personnel are not required to stay in the OR during image acquisition.[17]

All of this equipment is typically fixed in the suite and allows for ready utilization to produce very accurate high-resolution image quality.

Hybrid OR with Intraoperative MRI

Intraoperative MRI was introduced in 1993. Since then, it has been generally accepted as a valuable image guidance

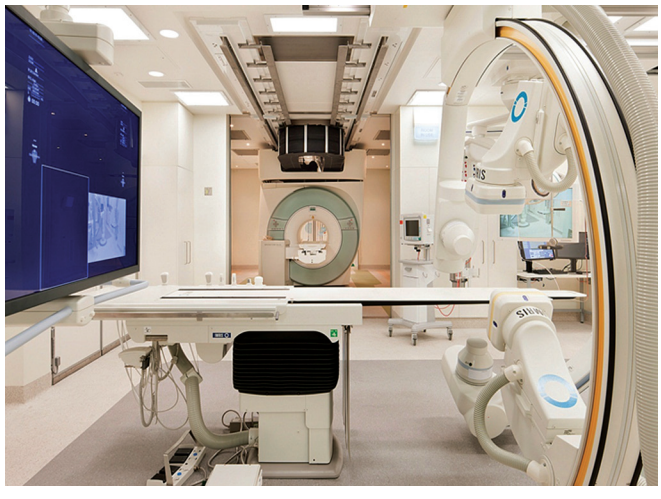


Fig. 2: Intraoperative magnetic resonance imaging

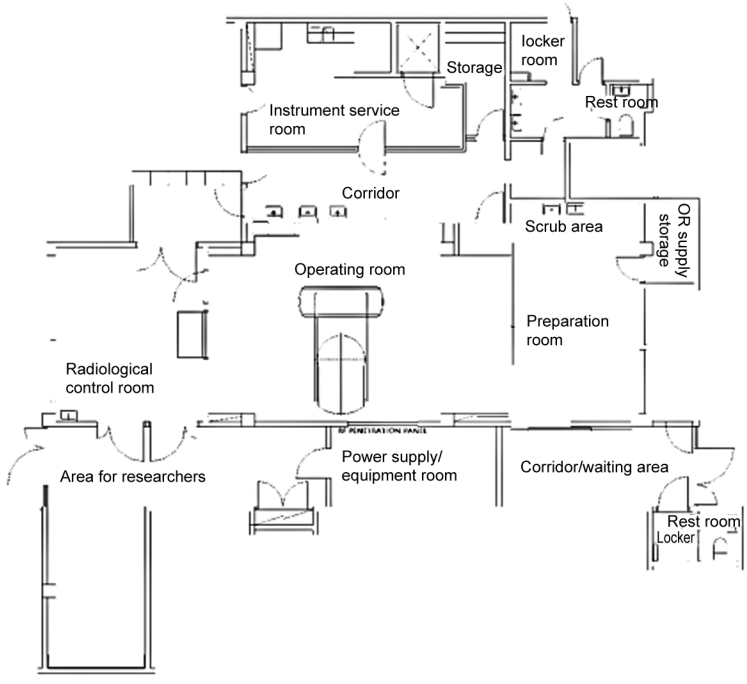


Fig. 3: Layout of the intraoperative MRI facilities at Oulu University Hospital[18]

tool for neurosurgery, but it still applies relatively immature and diverse technologies; its clinical indications are not well defined, and its potential impact on everyday neurosurgical practice is not yet fully recognized (Fig. 2).

Intraoperative magnetic resonance imaging (intraoperative MRI) is a promising method for image-guidance in minimally invasive neurosurgery. However, effective use of an intraoperative MRI unit requires new concepts that combine imaging and surgical environments. A compromise has to be sought between scanner design and imaging properties. The disadvantages of the method include the need for MRI-compatible instruments and devices, trained personnel to avoid accidents, a radiofrequency (RF)-shielded OR, and the necessary investment for the scanner.[18]

The reason for the early acceptance of intraoperative MRI is that it is not a so-called 'disruptive technology,' which necessitates the total transformation of a medical specialty. It has been easy to accept intraoperative guidance by MRI because it uses the same imaging modality for localization during surgery as it does for preoperative diagnosis. It also improves the now universally used intraoperative navigation by real-time, interactive, near–real-time imaging, with frequent volumetric updates. The main reason for the relatively slow proliferation of this technology is not necessarily the high cost of MRI systems but the lack of clear definition of the requirements of the various types of intraoperative MRI systems.[19]

Most of revised MRI facilities have been designed for use either as radiological intervention suites or as operating rooms (Fig. 3). The objective in planning the facilities was joint use by neurosurgeons and radiologists to allow frequent and varied use of the scanner. This made it necessary to create not only a unique operating environment but also an organizational model for administration of the IMRI Unit. Diagnostic imaging is supervised directly by the department of diagnostic radiology. For clinical intraoperative/interventional work as well as research a coordinating board may be established.[18]

Brainsuite is an integrated neurosurgery system that allows for more precise treatment of complicated tumors in sensitive areas of the brain. Brainsuite is the latest advancement in image-guided surgery, providing real-time views of the tumor site with intraoperative magnetic resonance imaging (iMRI).[20]

Future Perspectives[12]

1. Wireless devices will become reality in the near future and will overcome the direct limitations now present due to wire connection points.
2. Integration of robotic and navigational techniques into clinical practice may lead to improved catheter accuracy, stability, and safety in comparison with conventional techniques, while minimizing radiation exposure.

CONCLUSION

By maximizing the use of existing technologies while developing new approaches to treating these challenging cases, we hope that these would lead to improved overall clinical outcomes and further reduce the mortality and morbidity

rates associated with managing the cardiovascular patient. It is hoped that as these new fields develop and with increasing experience with these new hybrid methods, we may well be able to maximize the applicability of minimally invasive endovascular and hybrid technology to treat a larger cohort of patients with cardiovascular disease.

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CASE STUDY

Designing and Application of a Renewable Energy Model for a Tertiary Care Research Hospital

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ABSTRACT

Renewable energy can be harnessed from Solar and Wind energy to augment and substitute for the conventional energy for Healthcare institutes. This is economical and plentily available. This case study aims to design a Renewable energy model. Here various structural data and available expenditure has been utilized from a tertiary care hospital.

Keywords: Solar energy, Renewable energy, Wind energy, Sun hours.

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INTRODUCTION

Renewable energy pertains to the energy potential available naturally in the five elements of nature. However, this potential can be harnessed from Sun and Air in the form of Solar Energy and Wind Energy for the benefit of man. This unique concept has few advantages like low cost of investment; zero running cost, low maintenance cost, and promotion of energy conservation with subsequent protection of environment.

Healthcare Institutions in particular have a very high-energy demand. This is due to high requirement in thermally conditioned areas like operating rooms, blood bank, laboratories and intensive care units and also because of the necessity of running the healthcare facility 24 hours a day 365 days a year. The risk associated with power crunch can be in terms of both life and money. Hence, it is a demand of the day to explore the option of generation of renewable energy – not only to meet the growing demands and to save cost but also to have a standby in times of scarcity.

The most popular forms of renewable energy are Solar Energy and Wind Energy and amongst the available technologies– Solar Photovoltaic Systems, Solar Thermal Concentrator Systems and Wind Energy generation systems are most popular. Thanks to the ever-progressing technology, all these can be easily and safely installed on the rooftops of the buildings and generated energy could be channelized to meet the needs of a facility.

Thus in the seed of renewable energy, lie the following solutions:

a. *Solar concentrators*: For powering the chillers which contribute to an extent of 50% to the total energy requirement in hospitals.
b. *Solar photovoltaic systems*: For powering the electrical need during the day.
c. *Wind energy systems*: For powering during both day and night.

The technical and financial viability of the projects needs to be explored in detail and the net benefit has a wide range, depending upon the area available for installation and the geographical location of the healthcare facility. Renewable energy replaces conventional fuels in four distinct areas: power generation, hot water/ space heating, transport fuels, and rural (off-grid) energy services.

Power generation: Renewable energy provides 18% of total electricity generation worldwide. Renewable power generators are spread across many countries, and wind power alone already provides a significant share of electricity in some areas. Some countries get most of their power from renewable sources, including Iceland (100%), Brazil (85%), Austria (62%), New Zealand (65%), and Sweden (54%).

Heating: Solar hot water makes an important contribution in many countries, most notably in China, which now has 70% of the global total. Most of these systems are installed on multi-family apartment buildings and meet a portion of the hot water needs of an estimated 50 to 60 million households in China. Worldwide, total installed solar water heating systems meet a portion of the water heating needs of over 70 million households.

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Wind energy: Airflows can be used to run wind turbines. Modern wind turbines range from around 600 kW to 5 MW of rated power, although turbines with rated output of 1.5 to 3 MW have become the most common for commercial use. Globally, the long-term technical potential of wind energy is believed to be five times total current global energy production, or 40 times current electricity demand. This could require large amounts of land to be used for wind turbines, particularly in areas of higher wind resources. Wind power is renewable and produces no greenhouse gases during operation, such as carbon dioxide and methane.

Solar energy: Solar power is the conversion of sunlight into electricity, either directly using photovoltaic (PV), or indirectly using concentrated solar power (CSP). CSP systems use lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. PV converts light into electric current using the photoelectric effect.

OBJECTIVES

a. To study the electrical load requirement and load patter of Tertiary Care Research Hospital.
b. To see the feasibility of application of renewable energy like sun energy and wind energy at Tertiary Care Research Hospital to partly cover the power needs.
c. To calculate the open space and terrace space available at Tertiary Care Research Hospital and its centers.
d. To suggest a technical solution in terms of number of solar panels and windmills required for generating the needed output.
e. To suggest a financial model of the project covering aspects like- approximate initial investment, annual savings due to usage of renewable energy and break even time.

METHODOLOGY

1. The total appliance load (electrical load) was estimated. This includes chillers, pumps, lighting, air conditioners, servers, etc.).
2. Graphs and tables depicting load and cost tabulated on time line (annual/monthly/daily). As load could be different on different days of the week, daily load mapped in weekly trends.
3. Peak load (max. load) and base load (average load) was estimated.
4. Total area on terrace of all centers and main building was measured.
5. Maximum number of solar panels and wind machines that could be installed was estimated.
6. Data regarding total solar and wind energy available at Tertiary Care Research Hospital at various months in the year was gathered from Indian Meteorological Department.
7. Panels and wind machines capacity most suitable for Tertiary Care Research Hospital was identified and power that could be generated by the given number of machine was estimated.
8. To what extent the power needs could be covered by the renewable sources was calculated.
9. Approximate investment required and net savings estimation was done.

Based on the calculations are study results, it was ascertained if renewable energy could be partly or fully cover the electrical power requirements of Tertiary Care Research Hospital and if yes, to what extent is this coverage possible. The study brought out the technical viability regarding the expansion of renewable energy work in future and the financial breakeven point in years so as to estimate the annual net savings after breakeven.

DATA ANALYSIS

For a renewable energy project, the following categories of data is required:

a. Demand data (based on electrical connected load).
b. Structural data (based on land area available for installation of renewable energy equipment).
c. Renewable energy availability data (based on energy sources and geographical location of the institution).

Once the data has been collection, financial modeling is carried out, which consists of:

a. Investment required for the project.
b. Estimated savings calculated.
c. Break even threshold.

PROJECT MILESTONES

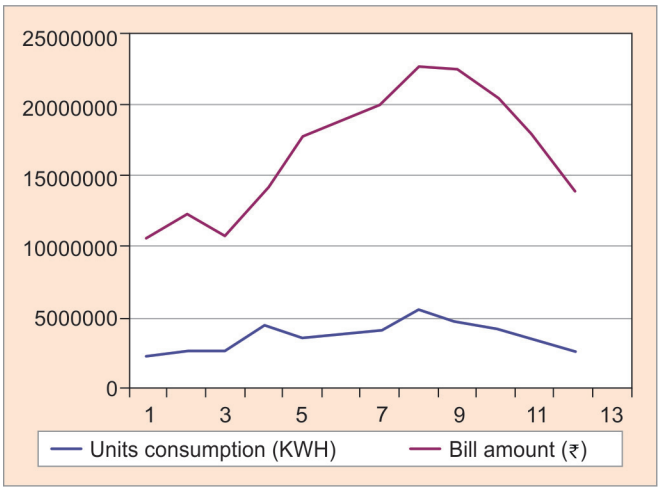
1. Estimation of need-from in house engineering records.
2. Collecting and analyzing energy availability data – from sources, like Indian Metrological Department, Satellite records and weather archives.
3. Arriving at the solution which is most viable — both technically and financially.

In this study, the following data sets were collected and analyzed:

(A) Demand data:

HT bulk demand at Tertiary Care Research Hospital and centres

Time period (2010)	*Units consumption (KWH)*	*Bill amount (₹)*
January	2317512	10697231
February	2686494	12358444
March	2696977	10738225
April	4537842	13824779
May	3547701	17844547
June	3809735	18981266
July	4040170	19969921
August	5529061	22706497
September	4642505	22520035
October	4204695	20710983
November	3523539	17753320
December	2686404	13965711
Total (annual)	44222635	202070959
Average (monthly)	3623912	16839247



(B) Structural data:

Facility	*Roof top area (sq. ft)*	*Roof top area (sq. mt)*
Tertiary Care Research Hospital (Ward block)	32741	3042
Tertiary Care Research Hospital (OPD Block)	54600	5074
Teaching Block	45960	4271
Para Clinical Block	63700	5920
Dr RP Centre (Ward Block)	17538	1630
Dr RP Centre (OPD Block)	28890	2685
Dr Brairch	23700	2200
Cardio-Neuro Centre	58600	5446
Cardio-Neuro Tower	6900	640
Total area available	332629	30908

Renewable Energy Availability Data

The two main sources of energy, as discussed earlier are solar and wind. Following are the aspects that are considered while estimating the energy availibility due to these sources.

Solar Energy

- Arc path of sun
- Solar radiation (watts/sq.mt)
- Sun hours/day.

New Delhi receives approximately 5 full sun hours of solar radiation every day. This energy might be obscured by atmospheric haze and cloud cover which has to be anticipated in predicting power output from solar energy collectors. This includes time period when solar radiation is of adquate intensity based on the arc path of the sun in New Delhi sky.

Wind Energy

- Wind speed (meters/sec)
- Wind direction
- Wind spectrum analysis.

Average speed for last 30 years in New Delhi = 3.7 meters/sec. Predominant wind flow direction is from West during the day and North-West, West in the night. It is to be noted here that for energy generation, 8 meters/second is considered as a good wind speed.

Searching for appropriate technologies: The study considered the application of solar photovoltaic cells, solar thermals and roof top wind generators. The following are specifications of the technologies that were studied:

1. Solar photovoltaic cells:
   - SW 230 PV panels
   - Peak power watts 230
   - Peak power voltage 29.6
   - Peak power current 7.76
   - Open circuit voltage 36.9
   - Max system voltage 600
   - Series fuse rating 15 a
   - Length 1675 mm, width 1001 mm
   - Depth 34 mm
   - Weight 22 kg
   - System efficiency 12 to 15%.

2. Solar thermals:
   - Powered by renewable solar energy
   - No emissions
   - Automated system control and monitoring
   - Produces temperatures as high as 392°F (200°C)
   - Collector length — 12 ft
   - Collector width — 5 ft
   - Total reflector area — 60 ft^2
   - Operating temp range — 122 to 500°F
   - Collector weight — 150 lb

3. Wind generator:

Physical parameters	
Turbine diameter (average)	2.75 m (108″)
Turbine height	4.2 m (165″)
Tower (standard)	5.5 m (18″)
Turbine weight (w/generator)	190 kg
Tower weight	540 kg
Roof mount weight (steel)	280 kg
Roof mount weight (aluminum)	90 kg
Shipping size	7.4 CBM

Performance parameters	
Start-up wind speed	2.5 m/s (5 mph)
Cut-in wind speed	3.5 m/s (7.5 mph)
Cut-out wind speed	25 m/s (56 mph)
Rated wind speed	12 m/s (27 mph)
Max (survival) wind speed	50 m/s (110 mph)
Rated lifetime	20 years

Generator (grid tie version)	
Type	Synchronous, permanent magnetic, 3-phase, 16 poles
Rated voltage	270 V
Rated temperature	<55°C
Revolutions per minute (RPM)	120
Drive type	Direct-drive
Protection	IP54
Insulation	Class B
Weight	90 kg

It was found in the study that solar photovoltaic system is less efficient that solar thermals. Although each Wind Turbine generate 4 kW rated power, due to low wind speed at New Delhi, it was not considered to be the optimal solution.

Salient Features of Proposed Renewable Energy Solution for Tertiary Care Research Hospital

Technical Model

- 1700 solar concentrators with trackers moving from east to west
- Systems output 5000 kW
- Proposed systems efficiency: 58%
- Total air conditioning load at Eye centre, cancer centre, CN centre of Tertiary Care Research Hospital, 6000 Tones/6400 kW
- Proposed solution will meet upto 90% of air-conditioning load.

Investment Model

- Investment ₹ 23.5 crore
- Total capacity of 5066 kW
- Actual yearly output 9,652,250 kW
- Subsidy available ₹ 5.5 crore
- Per annum energy saving in excess of ₹ 5 crore
- Over 25 years saving ₹ 140 crore

Key assumeptions used in the study:

- Saving of power charges paid to Electricity Utility Company ₹ 4.10 per kWH
- Escalation of power charges 15% year 1, thereafter 3% pa
- CDM credits eligibility
- Accelerated depreciation for off-grid solution 80%
- Corporate Tax Rate 33.22%
- Cash Flow discounting rate 10%
- Annual Maintenance Cost 1%
- Green Cess Saving ₹ 0.05 per unit
- Subsidy as per MNRE regulations.

Benefits and Government of India Incentives for a Renewable Energy Project

- Solar PV — ₹ 70 per Watt (Restricted to maximum of 100 kWp)
- Solar Thermal — 30% (Subject to maximum of ₹ 5400 per sq meter of solar concentrator)
- Wind and solar hybrid — ₹ 1 Lakh per kW (restricted to 50 kWp)
- Accelerated depreciation under section 32 of income tax act — 80%
- Saving in power bill
- Comply to regulatory requirement of GREEN building
- Additional power generation capability
- Better peak load energy management

- Long life of assets up to 40 years
- Low maintenance assets.

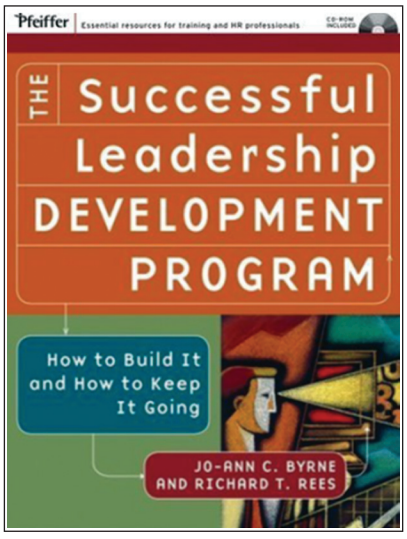
RESULTS

This Tertiary Care Research Hospital being one of the largest tertiary care hospitals in the country with more than 2000 beds, and has a massive annual electrical consumption. The study brought our the fact that energy equivalent to 2 to 3 months of electrical consumption could be obtained for free using renewable energy solutions which means an annual saving of up to ₹ 5 crores. The energy production is estimated to be around 1 crore units annually. The options explored were Wind Energy, Photovoltaic aided light energy and thermal energy. From the data obtained from Indian Meteorological Department, it was seen from the last 30 years average wind velocity that wind energy is not a technically viable solution for New Delhi. However, the results of thermal energy application using Solar Thermals could be a technically and financially viable solution.

CONCLUSION

The efficiency of the renewable energy systems, the saving in cost of running a healthcare facility which eventually reaches the patients in terms of increased affordability, encouraging government regulations and incentives for using renewable energy and the protection of environment are some of many features that demand an eager and positive look toward this revolutionary approach to the energy systems.

Book Review



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Publication of Year: June 2006
Publisher: Pfeiffer

The Successful Leadership Development Program: How to Build It and How to Keep It Going
(BY JC Byrne and RT Ress, San Francisco)

INTRODUCTION

There are many books on the market claiming to have the answers for developing the leadership potential in the reader. Some of these books do a better job than others, but still, reading a book is not all that it takes to develop the particular skills necessary for a specific job or profession. Jo-Ann Byrne and Richard Rees have created a process that will help companies and organizations develop a leadership development program rooted in their mission, vision and strategic goals. This program will be built upon the individual needs of employees and will be endorsed by senior-level management. This algorithm that Byrne and Rees have developed is the center of their book, The Successful Leadership Development Program. The book outlines the steps one should take in implementing a leadership development program in the work-place. This process is lengthy, but if done correctly can help implement a program that will be sustainable. Byrne and Rees have written a book that is easy to read and is well organized, so that the algorithm is easy to follow and steps are clear.

Theoretical Framework

The Successful Leadership Development Program is not based on any one leadership theory. It is however based on adult learning theories that promote the knowledge of leadership through developmental programs. Most leadership theories available today are grounded in the idea that leadership can be taught, and this is the same foundation on which Byrne and Rees have written their book.

Best Target Audience

Professionals who work in areas of employee training, leadership and professional development are going to gain the most from reading The Successful Leadership Development Program. The book offers them a step-by-step guide to creating a new program that will be intertwined into the fabric of the organization. The authors are able to provide great insight into

the process for professionals just starting their work in the field. This is a must-read for anyone thinking about implementing a new leadership development program into company culture.

Use of Book in Practice

The Successful Leadership Development Program can be best utilized when an organization is thinking about, or has decided to, implement a new employee-focused leadership development program. This book clearly articulates the steps that should be taken in order for a program to have a lasting place in the framework of a company or organization. Based on personal experience, the authors are able to provide strong insight for professionals in the role of developing a new program.

Weaknesses

Byrne and Rees are able to offer a great deal of insight that they gained through their personal experience developing a leadership development program. However, they do not ground their findings in literature. While the authors have not written this book as a strong piece of literature that offers support to theory, it would have made the book stronger if they would have provided some of the links between theory and practice in the text.

Another weakness of this book is that the authors interpret leadership development as being professional development. The book should be publicized as offering insight into developing leadership development (or professional development) programs in a work environment. The Successful Leadership Development Program was not written to identify particular needs of other groups, such as student organizations, sports teams, volunteer groups, or professional organizations. The frame used to look at the issues in this book is from a very hierarchical structure and may not translate to organizations that have a different structure.

Strengths

The authors are able to offer real world examples from their personal experience developing a leadership development program. Byrne and Rees are able to foresee issues in the process that they know can be detrimental to the creation of a new leadership development program, and have created an algorithm that will hopefully solve some of these major issues before they become problems. For example, they make a strong point of generating buy-in from senior level administrators early on in the process so that issues do not arise when it comes time for the program to be pitched to these administrators for approval of the program.

The algorithm that has been developed allows for entry into the process at any of the different stages. Therefore, it is able to serve the needs of many different campuses that all approach the creation of a new leadership development program with different levels of buy-in and with different commitments to leadership development in the organization culture.

Reviewed by
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Upcoming Events

2nd Middle East Forum on Quality and Safety in Healthcare 2014

Date: 25 Apr 2014 to 27 Apr 2014
Place: Doha, Qatar

This event will help to focus on how you can be empowered on the science of improvement and how to implement the safest and best healthcare practices to benefit patients. Participants will learn about the latest developments in Quality and Patient safety.

Bristol Patient Safety Conference 2014 (BPSC 2014)

Date: 16 May 2014
Place: Bristol, UK

This event will provide a forum for health facility planners, designers, builders, clinicians, managers and technology specialists to share, learn and celebrate successes in patient safety. Here there is a common platform for both speakers and delegates who can facilitate the wider introduction of healthcare innovation for a safer future.

Strategic Alliance Management Congress

Date: 5th May 2014 to 7th May 2014
Place: Philadelphia, USA

This event will bring together senior alliance management, business development, technology transfer and licensing professionals, to network, share experiences, discuss case studies, and to identify the components that cultivate successful partnerships. Delegates will gain strategic insights, proven tools, methods and perspectives from a variety of leaders advancing the art of alliance management.

11 HXMDP: Health Care Executive Management Development Program

Date: 7 Sep 2014 to 13 Sep 2014
Place: Ramoji Film City, Hyderabad

This event is organized by Department of Hospital Administration, AIIMS, New Delhi. The event aims to augment skills and competencies of various senior healthcare professionals in contemporary subjects of Hospital and Healthcare Administration. It will enable senior managers, executives and top health professionals both from Public and Private sector to gain insights that will positively impact their role in promoting safety, quality and productivity in healthcare.

Society for Medical Decision Making 15th Biennial European Meeting 2014

Date: 8th June 2014 to 10th June 2014
Place: Antwerp, Belgium

This event will consist of short courses, oral and poster presentation, workshops on subjects encompassing Bioinformatics, Clinical strategies, Disaster Management, Health economics, Health informatics with stress on clinical decision making.

Measuring Health Outcomes to Inform Policy 2014

Date: 27 May 2014 and 28th May 2014
Place: Melbourne, Australia

The conference will focus on how data can improve performance and innovation within organizations, how health measurements can redesign policy and how health outcomes can be linked to funding decisions. With contributions from

government representatives and health organizations a toolkit will be provided to implement these strategies within your own organization.

Advancing Excellence in Healthcare 2014 (AEH 2014)

Date: 19 June and 20 June 2014
Place: Glasgow, UK

Advancing Excellence in Healthcare 2014 is suitable for professionals working across a broad range of specialties. The Royal College of Physicians and Surgeons of Glasgow is committed to education, training and support of healthcare professionals at every stage of their career and this extends to our flagship conference which will be of benefit to all from undergraduate students to senior consultants.

Medical Informatics World 2014

Date: 28th Apr 2014 and 29th Apr 2014
Place: Boston, UK

This event will provide insightful discussions and engaging presentations wherein leading experts will share emerging trends and solutions in population health management, payer-provider-pharma data collaborations, optimizing patient care and engagement, leveraging mobile technologies, sustaining innovation within the rapidly changing care delivery models, enhancing clinical decision support, controlling costs and improving quality and maintaining security-privacy in healthcare.

Doctors 2.0 and You 2014

Date: 5th June 2014 to 6th June 2014
Place: Paris, France

This event will enable physicians on how to use New Technologies, Web 2.0 tools, Social Media to communicate with other healthcare professionals, patients, payers, pharmaceutical companies, public agencies.

The Research Foundation of Hospital and Healthcare Administration

INTRODUCTION

The Research Foundation of Hospital and Healthcare Administration has been founded with the aim to function as a scientific body encouraging and assisting research as well as all such activities that are likely to benefit art and science of Hospital Administration and Management in Indian subcontinent.

VISION

'Learn to lead, lead to learn' The Research Foundation of Hospital and Healthcare Administration (RFHHA) is the leading professional foundation in Hospital and Healthcare Administration in Indian subcontinent that strives to protect and promote the Art of Hospital and Healthcare Administration, facilitate capacity building in Indian subcontinent so that clientele can enjoy quality healthcare and can live, grow and prosper in clean and safe communities. The foundation envisions to develop leaders for the health sector so as to enhance the global competitive edge of our healthcare systems.

MISSION

'To strengthen management in healthcare through training and research, best practices and transformational initiatives to meet contemporary and future social, economic, ecological, technological challenges by facilitating the exchange of information, experience, research and advocating for policies, programs and practices that will improve health sector'.

Who can be a Member of RFHHA?

Hospital Administrators, Armed Forces Medical Service Officers, Medical Superintendents, Hospital planners and designers, Hospital Service Engineers, Nursing Administrators of Civil and Armed Forces, Hospital Architects, Dean, Directors, CEOs, VPs, Presidents, Chairman of hospitals. Senior doctors occupying/likely to occupy leadership positions in medical and healthcare organizations. Doctors involved in policy-making, program development and implementation at large hospitals/medical colleges and those responsible for healthcare capacity building, efficiency and excellence in medical service delivery, etc. Students of hospital management are also eligible.

How are You Benefited as Member?

Interaction with peer group will help you to:

1. Enhance your skill set in the core competencies required to be an effective hospital administrator.
2. Deliver growth by evaluating and more effectively managing your performance value drivers.
3. Confidently make strategic decisions by applying new frameworks in healthcare.
4. Gain fresh insights and perspectives on similar challenges faced by other participants.
5. Benchmark yourself against your peer group across organizations and industries.

Benefits of Associate Member

1. One CME/Work Shop free for life on first cum first serve basis.
2. Fellowship in Hospital & Healthcare Administration.
3. Research Grant/Assistance.
4. Free e-journal for life.
5. Free access to RFHHA e-Library: a large number of educational materials for members is free of cost.
6. Daily emails and sms on various contemporary administrative and management issues pertaining to hospital management.
7. Free webinar arranged by RFHHA.

What are the Benefits to Your Organization?

1. Greater organizational performance.
2. Grooming Healthcare Leaders to assume senior management positions.

3. Better retention and development of the most talented healthcare workforce.
4. Improve the way your administrators deal with challenges across different organizational requirements.
5. Officials with greater self-awareness of their actions and understanding of the impact of their behavior on the organizational growth result in enhanced organizational productivity.

Conferences held by RFHHA

1. Healthcare Infrastructure and Medical Technology (HIMT 2011) at AIIMS, New Delhi, India.
2. CME on Patient Safety as National Initiative of Patient Safety (NIPS 4, 5, 6, 7) at AIIMS, New Delhi, India.
3. CME on Patient safety at Jammu Medical college, Jammu, Jammu & Kashmir, India.
4. Health Executive Development Program on Store Management at AIIMS, New Delhi, India.

TYPES OF MEMBERSHIP

Lifetime Associate Membership

Membership Fee: ₹ 8000

Corporate/Institutional Membership

Membership Fee: ₹ 1,50,000

1. This membership can be availed by big hospitals, institutions or any other organizations interested in the objectives of the RFHHA.
2. The grant of membership and monetary contributions for becoming a corporate member shall be decided by the general body (GB) from time to time, and the said contributions will be credited to the RFHHA account.
3. All privileges of an associate member are applicable for 10 members of the corporate/institution as decided by them.