



Efficiency Saving, Cost Improvement and Productivity: A Case of a Tertiary Care Hospital in Nepal

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Abstract

In today's dynamic healthcare landscape, achieving a delicate balance between efficiency, productivity and maintaining quality of care is crucial for healthcare organisations striving to deliver optimal outcomes to patients while managing costs effectively. This research explores the intricacies of balancing efficiency, productivity and quality of care in a healthcare setting, providing a good example and drawing from credible sources to elucidate strategies for achieving this equilibrium. This study examines the effectiveness of a programme called 'Efficiency Saving, Cost Improvement and Productivity (ESCIP)', which was implemented in a tertiary care specialised hospital in Nepal.

This study was carried out by using case study research method. The ESCIP Programme was divided into three phases (planning, intervention and assessment) and all these phases are evaluated and discussed in this paper. The best practices, lesson learnt and challenges are shared.

Keywords: Efficiency, productivity, quality, hospital, lean health

Introduction

Nepal is situated between India and China and is a developing nation. The population of Nepal is 29.3 million (1) and the GDP per capita of Nepal is US\$ 4,726.6 (2). According to The World Bank, it comes under the category of Low Middle Income (LMC) country. This case study was conducted in a 150 bedded tertiary care specialised private hospital (referred as Hospital A in this article) in Nepal. The Hospital A sees around 41,000 patients a year in its outpatient department (including follow ups and new patients) and generates US\$12 million revenues a year. A total of 612 employees directly works for the Hospital A.

Affordable and accessible healthcare in developing nations like Nepal is not simply a desirable goal, but a critical necessity. Lack of access to quality medical services fuels preventable deaths, hinders economic development and traps individuals and families in cycles of poverty [3]. When healthcare is prohibitively expensive or geographically distant, basic ailments can spiral into life-threatening illnesses, children miss out on crucial immunizations and pregnant women face dangerous complications. This, in turn, weakens the workforce, reduces productivity and perpetuates inequality. By investing in affordable and accessible healthcare, Nepal can empower its citizens health and wellbeing, break the cycle of poverty and build a healthier, more prosperous future. This requires a multi-pronged approach, including expanding public healthcare systems, promoting affordable private options and fostering community-based healthcare initiatives.

Healthcare is complex, rapidly changing and a costly affair. Healthcare is a business of everyone, everyone needs it from birth to death and is the responsibility of everyone. By prioritising healthcare accessibility, Nepal can unlock its full potential and ensure well-being for all its citizens. By offering specialised care and attracting patients who might otherwise seek treatment abroad, private tertiary hospitals can alleviate pressure on overburdened public facilities. There is an increase role of private hospitals in Nepal and patients 'choose private hospitals over public hospitals due to the poor quality of infrastructure and the poor health services in the government hospitals' (p.197) [4].

The concept of health sector efficiency seeks 'to capture the extent to which the inputs to the health system, in the form of expenditure and other resources, are used to secure valued health system goals (p.1) [5]. Inefficient healthcare has a double bind: patients suffer poorer health outcomes and valuable resources are wasted, depriving others of care. This makes boosting efficiency a top priority, especially amidst resource limitations in developing nations. The definition of efficiency underscores the importance of achieving a balance between quality, quantity and cost-effectiveness in healthcare delivery.

Efficiency savings in healthcare refer to reducing unnecessary costs and waste while maintaining or even improving the quality of care delivered. It's not about cutting corners or compromising patient safety, but rather about optimising processes, eliminating

redundancies and allocating resources effectively. This optimisation can cover various aspects, including - operational efficiency, clinical efficiency and resource utilisation [5]. According to 'World Health Report' published by WHO, 2010, 20% - 40% of all resources spent in health services are wasted due to inefficiencies. The report has highlighted ten major sources of inefficiencies, such as use of medicines, ineffective prescriptions, wrong set of skill mix of healthcare professionals, weak infrastructure, limited transparency and accountability etc. are some of the causes of inefficiencies in healthcare [6].

While public healthcare forms the backbone of medical services in Nepal, private tertiary care hospitals play a crucial role in supplementing and diversifying healthcare options, offering several key advantages. Public hospitals often face resource constraints, limiting access to specialised services and advanced technologies. Private tertiary care hospitals, through targeted investments, can bridge this gap by offering expertise in critical areas like oncology, cardiology and neurosurgery, as evidenced by a study by KC et al [7]. This expanded access can be life-saving for patients requiring specialised interventions previously unavailable in Nepal.

The Hospital A was in a position of cumulative loss of US\$ 1.38 million. Therefore, the Hospital Board was interested to introduce programme and initiatives that help to minimise waste, errors or flaws and maximise productivity, clinical and financial outcomes without compromising quality of care. Moreover, the private healthcare market in Nepal is competitive. Therefore, private hospitals must focus on delivering healthcare on competitive charges and providing the best possible quality care without any compromises to stand in the crowd. There was a real need to find out ways to gain efficiency saving and improving quality of care. In this context, the aim of delivering efficient services was the focus of the Board of Directors of the Hospital A and the Hospital Management. Optimising healthcare delivery shouldn't be seen as mere cost-cutting, but rather as a way to maximise positive patient outcomes and ensure equitable access to care, especially in resource-scarce environments [5]. The Hospital A introduces a programme called 'Efficiency Saving, Cost Improvement and Productivity (ESCIP)'. The following were the objectives of the ESCIP Programme:

- To review the current processes and practices in relation to the use of resources by various departments and units.
- To increase awareness amongst the staff regarding reducing waste, unwanted variations, improving cost and increasing productivity.
- To develop processes and procedures to implement the ESCIP Programme in a sustainable way.
- To encourage clinical leads, Head of Departments, Unit In-charges, health care professionals and staff to actively participate in the ESCIP Programme and to achieve its objectives.
- To implement the project in a sustainable way without compromising the quality of care and services.
- To disseminate lessons learnt from the ESCIP Program and create an environment to celebrate the success.

Methods

Case study research was designed to examine the effectiveness of the ESCIP Programme and to share the findings for learning and sharing purposes. This study is limited in the Hospital A, which is under study. However, the case study method offers an adaptable approach and allows to establish a scope to ensure a focused and manageable research endeavours.

According to Thomas (2012), '*the case study method is a kind of research that concentrates on one thing, looking at it in detail, not seeking to generalise from it*' (p.3) [8]. In line with this definition, Simon (2009) further adds that a case study probes into a specific project, policy, institution, programme or system; and explores its real-world complexities and unique attributes from various viewpoints [9]. Case studies enable researchers to go beyond superficial explanations, uncovering intricate dynamics, relationships, and influences within a specific case. This holistic approach provides a richer understanding of the phenomenon under investigation [10].

This subject of efficiency saving is little explored in the context of the healthcare system in Nepal. There are no studies found in this subject in Nepal. Case studies are particularly valuable for researching under-studied or emerging phenomena where little theoretical or empirical knowledge exists. They allow researchers to explore the issue in detail and generate new insights [11]. Each case holds its own unique set of features and circumstances. By focusing on a single case, researchers can capture these nuances, offering a more complete picture than broader, standardized approaches [12].

Case study incorporates the perspectives of various stakeholders, including participants, policymakers and community members and it offers a richer understanding of the organisational, social and political contexts surrounding the phenomenon [13]. Unlike quantitative studies that focus on "what" and "how much," case studies excel at explaining "why" and "how" things happen within a specific context. This makes it ideal for understanding the causal mechanisms and processes at play [10]. Because of the reasons explained in this section, the case study method was applied in this research. As part of the case study and to explore the qualitative side of the study, some participants were interviewed to assess their perceptions about the effectiveness of the ESCIP Programme. The findings were summarised and trend analysis were carried out. Some of the statements from the interview are quoted and a brief summary of trends from interviews are also presented in this case study.

Results

The results of the case study are divided into three main sub-headings – planning, intervention and assessment of the results of the ESCIP Programme.

Planning

The ESCIP programme was designed in a structured and systematic way with the active engagement of employees and the Hospital Board and input or feedback from service users through surveys and patients feedback cards. The Board of Hospital A

approved the ‘Procedures for Efficiency Saving and Cost Improvement for Productivity (ESCIP)’, which described detailed protocols for planning, implementation and control of the Programme. This procedural document explained objectives and scope of the Programme, roles and responsibilities of Board of Directors, Hospital CEO, Department Heads/Manager or Unit In-charges, guidelines to implement the Programme, training requirement, monitoring compliance, steps or outlines of the Programme process and project timetable. This procedure follows one of the approaches of lean healthcare, which has been practised widely in health services to reduce waste, increase productivity and improve quality of care [14]. For example, the Cleveland Clinic, a renowned healthcare institution in the USA, has implemented lean management principles to streamline processes, eliminate waste and enhance efficiency while maintaining high standards of quality and patient safety [15].

An ESCIP Programme Committee was formulated to develop tools, techniques, train staff, implement and monitor the Programme. The ESCIP Programme Committee consisted of the following people from the Hospital A:

CEO:	Chair
Chief Finance Officer:	Deputy Chair
Head of Departments:	Member
Administration Manager:	Member
Hospital Operations Manager:	Member
Quality Improvement Manager:	Member Secretary.

There was a provision that other members from the Hospital A could be invited as an invitee to Programme meetings as required. The following steps or processes were approved and followed for the ESCIP Programme

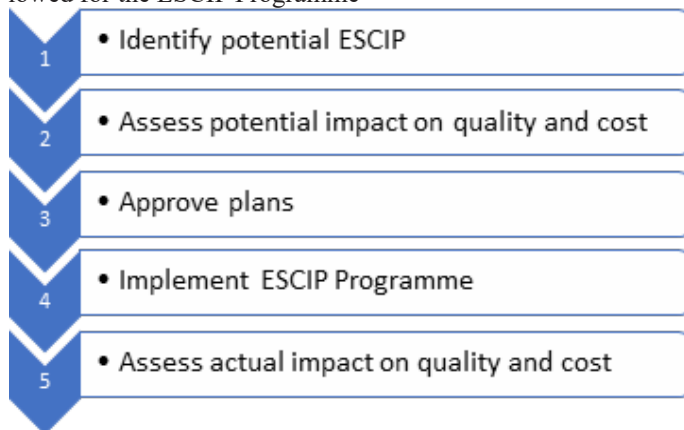


Diagram 1: ESCIP Process

Training programmes were designed and delivered to different levels right from the Board of Directors to Head of Departments, Managers, Unit In-Charges and front-line staff those who were interested to participate in the Programme. The main aim of this training was to help delegates understand the principles and practices of efficiency saving, cost improvement and productivity. This programme was designed to enhance their knowledge and skills to implement the ESCIP Programme and to bring visible changes in terms of increasing productivity, efficiency saving

and improving cost. A total of 71 personnel participated in the training programme. The training programme was designed and facilitated by the Hospital CEO/Chair of the ESCIP Programme Committee and was delivered by members of the ESCIP Team.

Notices and all staff emails regarding the ESCIP Protocols, Implementation Plans, Tools and Techniques were sent to staff of the Hospital A to raise awareness, to support staff and to implement the Programme. Project Management Tools such as Gantt Chart, Action Plan Template and Risk Management Tool were also used to guide staff and track the progress of the Programme. Project management tools facilitate healthcare projects to accomplish pre-defined goals [16]. A monthly meeting of the ESCIP Programme Committee used to be called to discuss various aspects of the Programme, such as issues arising, hurdles, progress on implementation etc.

Intervention

The second phase of the ESCIP Programme was to implement the Programme or the intervention phase. During this phase, review of the operational and capital expenditures, workforce review and process mapping were carried out. The principles of lean healthcare were applied in this Programme, which aimed to reduce waste or errors in the process and maximise value for service users. As explained by Vandale (2021), the goals of lean healthcare are to apply quality improvement techniques and tools for the smooth operation of health services without hassle and waste in order to perform better and to organise operations of health services to maximise flow of value to service users by implementing continuous quality improvement [17]. According to the Lean Enterprise Institute (2024), there are five major steps of Lean: 1. Identify value, 2. Map the Value stream, 3. Create flow, 4. Establish pull, and 5. Seek perfection [18].

Review of operational and capital expenditure: The Chief Finance Officer led a team of staff of the Hospital A to review operational and capital expenditures of clinical services and non-clinical departments. Initially a time driven activity-based costing method was proposed to review costing of hospital services. Due to insufficient information, costly approach and lack of expertise within the Hospital A, this approach was abandoned. Therefore, a traditional costing method or process of classifying, recording and predicting costs that are incurred by the Hospital A was followed [19]. The Finance Team were engaged in derivation of norms of hospital services and resources used, projection of future costs, identification of alternative costs and their interpretation. Costs of hospital services were produced to understand whether the Hospital A services were managed efficiently and effectively and to review the cost for future planning.

Workforce Review: Efficiency can be improved by improving the workflow process without compromising quality of care (20, 17). Two groups of employees – directly employed by the Hospital A and employed through outsourced companies were working for the hospital. As a part of the workforce review various data and indicators such as employees’ rota, work shifts, work-

ing pattern (full time and part time contracts), performance review, human resource information, benchmarking against industry best practices and standards, exit interviews and interviews with Head of Departments and Unit In-charges were followed. The workforce review helped to assess staff workload, find out inefficiencies and non-value-added processes. This exercise was carried out in consultation and active engagement of Department Heads and Unit In-charges. As a result of the workforce review, staff numbers were reduced as shown below in **Table 1**.

Process Mapping: Process mapping technique was used as an improvement tool in procurement, workforce evaluation and patient pathways. Improved patient pathways and integrated delivery of healthcare are well linked with improved quality of care and efficient health services [21]. Process mappings of clinical services were conducted to find out gaps and value in services and to develop integrated care pathways. Integrated care pathways emphasizes collaboration among multidisciplinary teams, patient-centred care delivery and a focus on outcomes, resulting

in improved efficiency, productivity and patient satisfaction [22]. Five Whys root cause technique was used to find out root causes of the problems or delays encountered by departments and services. The procurement system and processes were examined and analysed by using process mapping techniques. Similarly, recruitment, selection and human resources protocols and processes were also mapped as a part of the workforce review.

Assessment

Key performance indicators before and after the introduction of the ESCIP Programme were compared to assess the effectiveness of the programme. The following table shows key performance indicators pre and post ESCIP Programme:

S.No.	Key Performance Indicators	FY 2020/21	FY 2021/22	Variance
1.	Number of New Patients (Monthly Average)	611	709	14%
2.	Number of Follow Up Patients (Monthly Average)	2,261	2,664	15%
3.	Number of Surgery (Major, Intermediate and Minor) (Monthly Average)	191	231	17%
4.	Number of Radiological Investigations (Monthly Average)	1,865	6,069	225%
5.	Number of Pathological Test in Laboratory (Monthly Average)	3,676	12,777	247%
6.	Bed Occupancy (%)	58%	65%	7%
7.	Monthly Average Revenues (Rs in Crore)	US\$ 0.67 Million	US\$ 0.78 Million	16%
8.	Monthly Average Expenditure (Rs in Crore)	US\$ 0.61 Million	US\$ 0.67 Million	10%
9.	Total Number of Employees	578	545	(5.7%)
10.	Total Number of Outsourced Employees	101	96	(5%)
11.	Patient Satisfaction Rate (%)	89.7%	91.7%	2%
12.	Number of IP Admissions	4902	5501	12.21%

Different types of key performance indicators are being used to measure, evaluate and monitor efficiency in health and social care [23]. As shown in the table 1 above, reduction of workforce by 5.7% (employed by the Hospital A) and 5% (employed through outsourced companies) were noted because of the workforce

review, while the outpatient activities in the same period were increased by 14% (new patients in outpatient), 15% (follow up patients in outpatients) and 12.21% (inpatient admissions). Inpatient bed occupancy increased by 7% points in the same period. Similarly, the monthly number of investigations of

radiological and pathological tests significantly improved in the same period. There were no additional hospital capacities added during this period. The improvement on services, reductions of wastes and better use of resources increased productivity and performances in outpatient, inpatient and diagnostic services of Hospital A. There was a 17% rise in surgical operations. This was mainly due to improved theatre processes and increased patient flow in outpatient and inpatient services. Healthcare operational performance targets and protocols can be used to improve service users' outcomes and reduce costs by reforming processes such as waiting times and patient pathways [24].

The impact of the ESCIP Programme was evident. Monthly average revenue grew by 16% and the growth of monthly expenditure was just 10% for the average of 16% growth in overall activities and revenues. It was notable that the Hospital A was able to distribute a 10% dividend to its shareholders, which was the first dividend paid to its investors after it was established nine years ago. Similarly, employees of the Hospital A were paid a bonus equivalent to two and half months' basic salary. This was again a significant financial achievement to the Hospital A and a great motivational factor to its employees.

Quality of care provided by the Hospital A was measured and evaluated in terms of patient satisfaction. The patient satisfaction rate was increased by 2% points in the same period after the successful launch and implementation of the ESCIP Programme. Other quality indicators such as mortality rate, re-admissions rate and adverse incident or patient safety incident rates were not available to comment and discuss.

Managers and Staff of the Hospital A valued the ESCIP Programme and expressed positive opinions about the Programme. All together seven Managers and Department Heads of the Hospital A, who were part of the ESCIP Programme and focused on efficiency saving and cost improvement, were interviewed. The interviews were conducted by using a semi structured tool to gather information about their perceptions on achievement of the ESCIP Programme. Their experience and perceptions of participants of the Hospital A were very positive. There were mainly three trends emerged from the interviews: learning and enhancing participants' knowledge on ESCIP, positive impact on reducing overall cost of health services and improving visible quality of healthcare in the Hospital A. Two participants expressed their concern for the short duration of the Programme to assess the impact, even though the impact was assessed after a full year of the implementation of the ESCIP Programme. Implementing new programmes in any healthcare institutions may encounter resistance from healthcare professionals accustomed to existing practices. However, staff expressed happiness to learn that there was no resistance from the front-line staff and in-charges during the planning, intervention and implementation phases of the ESCIP Programme.

One Manager highlighted, *'I learnt a lot during the training, implementation and assessment of the ESCIP programme. This project is financially viable and helped to improve quality of care and financial sustainability'*. Another Manager, who played

crucial roles for the implementation of the project stated, *'we have never looked back and reflected what we have done in the past. This programme should have been introduced in the early years of this hospital. I am very thankful to the Hospital Management for giving me a chance to participate in this programme and contribute to improve hospital services by eliminating waste and inefficiencies. I can see visible changes and improvement in all sides of the business – strategic planning, economy, business growth and customer satisfaction'*.

The outcome of the ESCIP Programme was discussed at the Board of Directors meeting of the Hospital A and the programme was highly rated and appreciated by them. This was noted as follows at the Board meeting: *'Some Key Performance Indicators related to the ESCIP Programme were presented to the Board of Directors meeting. The Board appreciates and thanks the members of ESCIP team, Hospital Staff and other stakeholders who participated and contributed to the programme. Significant achievements are noted in the overall performance of the hospital services. The Board unanimously decides to continue the programme and review its activities and performance in the next six months'*.

Discussion

Healthcare systems worldwide face the constant challenge of delivering high quality care while grappling with rising costs and finite resources [24]. Achieving efficiency savings emerges as a crucial strategy for Hospital A to ensure its sustainability and to improve clinical and non-clinical outcomes, while the hospital incurred financial loss, faced rising cost of health service delivery and increased competition. But there is a valid argument, what exactly are efficiency savings in healthcare and how can we achieve them while navigating the inherent challenges, particularly in developing countries.

Efficiency savings refer to the process of optimising resource utilisation to achieve better outcomes without compromising quality. In the context of healthcare, these savings involve streamlining patient pathways, reducing waste and maximizing the value delivered to service users. The goal of the ESCIP Programme was to maintain or improve services while minimising costs. Finding out the accurate costing of services is very important in this aspect. Use of traditional costing methods to analyse and calculate cost of hospital services were used in this Programme, which could have been improved by adopting activity-based costing. The traditional costing method was applied in certain contexts as explained earlier in this article.

Efficiency in healthcare can be subjective, it may be different in the context of different healthcare organisations or systems. This article discusses efficiency saving in the context of a developing nation and presents a case of a private tertiary care hospital in Nepal. There may be questions to generalise the result in public and other general private hospitals. This case study demonstrates that use of right tools and approaches achieve efficiency targets, improve cost of services and quality of care. Berwick and Hackbarth (2012) identified six areas of waste in the US health system (e.g. failures of care delivery; failures of

care coordination; overtreatment; administrative complexity; price failures; and fraud and abuse) which, if addressed, could produce efficiency gains of at least 20% of total health care expenditures [25].

This case study also demonstrates that there was good evidence of improved financial, operational and clinical performances as a result of the implementation of the ESCIP Programme. The key performance indicators measured and analysed for the ESCIP Programme included both financial and clinical indicators. Even though the list of key performance indicators was not long, it was representative of the hospital services and performances.

One of the common issues in efficiency saving, cost improvement and productivity is measuring input (resources), output and health outcomes. This case study uses some common key performance indicators (as shown in Table 1) to measure pre and post ESCIP Programme performance of the Hospital A. There may be other internal and external factors such as market, social determinant, government rules, disease patterns, etc. that might have contributed to the improved outcomes or better performances of the Hospital A. This aspect is difficult to measure and analyse. As pointed out by Cylus, Irene and Smith (2016), the Hospital A has no control or influence over these variables [5]. Stakeholder and staff engagement to introduce and implement a new change management programme is very important [26].

One of the success factors, as highlighted by the participants, was active engagement of healthcare professionals and stakeholders in the change process, listening and addressing their concerns and highlighting potential benefits. It is equally important to provide healthcare professionals with adequate training and support to adapt to new processes for the successful implementation of the Programme. Limited financial resources, budget constraints and organisational policies that incentivise volume over value pose significant challenges to achieving efficiency in healthcare [27]. However, a private hospital can be flexible to introduce its own policies and prioritise resources to achieve its goals and objectives [28]. From the interviews with the staff, it was noted that the leadership team were very supportive to staff, very motivated and positive about this programme. Effective leadership and good governance are essential for driving organisational change, fostering collaboration and aligning stakeholders around common goals and objectives [29].

Developing countries like Nepal faces limited financial resources, specialised staffing shortages and competing priorities in healthcare. These factors may pose challenges to achieving optimal efficiency, productivity and quality of care. Strategic resource allocation, Re-distributing tasks among healthcare professionals, streamlining patient and management pathways, reducing bottlenecks, minimising delays, performance-based management and partnerships with external stakeholders certainly help optimise resource utilisation and mitigate constraints in healthcare in Nepal. Despite these strategies, successful implementation requires organisational agility. Motivated staff, effective change management and adaptability are crucial. Healthcare institutions in Nepal must embrace

innovation, learn from best practices and continuously evolve in the future for achieving efficiency saving, cost improvement, continuous quality improvement, sustainability and productivity.

Summary

Efficiency in healthcare can be perceived as the extent to which health services provide value to service users, balancing the quality of care, the quantity of services and the cost of providing those services. Balancing efficiency, productivity and maintaining quality of care in healthcare requires a multifaceted approach, as discussed in this case study, that integrates lean healthcare, standardised processes, optimised staffing models and a commitment to continuous quality improvement. By drawing inspiration from successful example of implementing the ESCIP Programme, addressing challenges proactively and embracing a culture of and collaboration, healthcare organisations can achieve the elusive equilibrium that optimises patient outcomes, enhances operational efficiency and sustains long-term success in a rapidly evolving healthcare landscape.

Conflict of Interest

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