

A PROPOSED FRAMEWORK FOR ASSESSING LEAN READINESS IN SOUTH AFRICAN HEALTHCARE INSTITUTIONS

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ABSTRACT

Recent healthcare literature has upheld lean as a methodology for improving operational efficiency and quality of care. However, the uncertainty of implementing lean successfully is still of concern as implementation failures have been recorded. Insufficient preparedness and lack of readiness assessment among other factors have been highlighted as a reason for failure. This paper develops an instrument for assessing the capabilities, quality management practices, and general preparedness of healthcare institutions for a lean implementation journey. The study identifies, through a comprehensive review of lean healthcare literature and the South African healthcare quality improvement literature to find current best quality management practices, and resource requirements needed to create a healthcare system that is supportive of lean. Application of this framework may provide an opportunity for hospital managers to benchmark with emerging lean success stories within the same operating context for organizational learning.

Keywords - Lean, lean healthcare, lean readiness, lean questionnaire, South Africa.

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1 INTRODUCTION

Healthcare institutions globally are under pressure to stay competitive, improve the quality of patient care, employee wellness and increase stakeholder value. There is also a challenge of emerging infectious diseases, new treatment technologies, and prevalence of medical errors, coupled with under capacity of skilled human resource, shortage of essential equipment, infrastructure and necessary consumables [1-3]. Hence, many are willing to deploy innovations like lean that has the potential to save cost, optimise resource utilization and deliver incremental value creation. Continuous improvement strategies like lean are susceptible to failure due to insufficient preparation - lack of strategic alignment [4,5] poor understanding of 'organizational force field' [6] inadequate managerial intentions and commitment [7] and organizational culture [4,5,8]. Further, the inability to define the potential gain (financial and non-financial) and obtain stakeholder buy-in; poor definition of roles, and lack of strategic direction in the lean journey may result in confusion among employees who fear they may become victims of change, thus resulting to sabotage. People may also experience frustration due to a lack of know-how and resource insufficiencies. Hence, several studies have emphasized the need for organizations to establish their readiness status before a lean implementation journey [4][9][10][11].

The origin of lean can be traced back to over 100 years of the Toyota Production System (TPS) [12]. Lean manufacturing was invented by Ohno Taiichi around the 1950s and deployed by organizations after the world war II, to improve manufacturing productivity - achieving the best quality, shortest lead time and lowest cost, through the waste elimination [13][14]. Lean sometimes referred to as lean thinking, lean production system, lean manufacturing, or lean management was popularized by [15] in their book "The machine that changed the world".

Lean is defined as a management practice focused on improving customer (both internal and external) value by reducing all forms of waste (muda), process variation (mura), and poor working conditions (muri) [16]. Waste is defined by Toyota's Fujio Cho as "Anything other than the minimum amount of equipment, space and worker's time, which are essential to add value to the product" [14]. The common waste experienced in healthcare includes - excessive waiting by patients, duplication of patient records, absence of needed supplies and equipment leading to downtime and idling of staff, unnecessary procedures, unnecessary movement of staff and patients, over-processing like an unnecessary repeat of pathological tests, procedural delays [9][16]

Lean is suitable in a multidimensional knowledge work environment like South African [17] as it fosters teamwork, employee recognition, a common purpose of continuous improvement; and respect for others [18]. However, some authors have cautioned that adopting internationally applied healthcare innovations without meticulous consideration of 'on the ground realities' could be devastating [8][19]. Andersen [20] further recommends that lean implementation, potential outcome, content, and critical success factors, should be explored in the context of the organization's structural, strategic, cultural and technical, environment [20]. Hence, the current South African healthcare system's operational challenges, governance, and contextual issues were also reviewed in the study.

Although lean originated from the manufacturing industry, many healthcare journals show a significant interest in lean as a mechanism for increasing system effectiveness, operational efficiency [21] and safety [1]. Vamsi & Kodali [23] review of twenty years of empirical studies on lean identified a scarcity of empirical studies in lean in undeveloped countries. Additionally, the significance of data triangulation and large sample sizes in lean healthcare research is yet to be explored [23]. They further emphasized the need to develop a systematic, context-based lean application framework to facilitate easy implementation.



Although lean has undergone three decades of application in healthcare, the healthcare domain in South Africa has recorded little empirical contribution. Several recent studies affirm that lean is yet to be fully explored by South African (SA) industries especially the healthcare sector [16][24][25].

SA hospitals and clinics who are initiating lean and benchmarking with implementing countries (with recorded success) must consider current national and system capabilities [19]. Initiating lean without ascertaining the degree of organizational readiness may have both unwarrantable and wasteful consequences.

A readiness assessment enables managers to identify and understand potential implementation gaps some of which are contextual. Bridging these gaps by deploying efforts and resources where necessary underpins the success or failure of sustainable lean systems in healthcare. SA hospitals are starting to initiate lean. Hence, developing a framework for assessing the current realities, capabilities and preparedness of SA healthcare institutions is imperative for a successful lean implementation journey.

2 LITERATURE REVIEW

In this section of the paper, we briefly capture the SA context that gave impetus to lean implementation in the healthcare sector; a snapshot on the nexus of lean, potential benefits of lean, lean awareness, lean principles and tools. Further, the quality management practices that are prerequisites for lean implementation in healthcare: operations process planning, co-ordination and control, and quality practices as expected within different stakeholder groups (top management, employee group, patient/customer, and suppliers group) and organizational culture which are needed for lean are presented.

2.1 The South African context

In the new democratic republic of South Africa, compliance to quality standards and commitment to maintaining quality in healthcare is considered a statutory expectation from all concerned [22][32]. Since the post-apartheid, the government has made huge investments towards upgrading the healthcare system [22] [26].

2.1.1 Public healthcare system

The South African health system trajectory is interlinked and driven by her apartheid historical travail [18]. A two-tier healthcare system leading to a wide disparity between public and private healthcare systems, urban and rural facilities [28]. Even in the public sector, healthcare deliverables remain fragmented and unbalanced [27]. The public healthcare system is battling with the problem of long waiting lines, inability to make efficient and safe quality care accessible to patients [27], poor service delivery and shortages of skilled human resources [28].

The funding structure for the Municipality, Provincial and National public healthcare institutions are also different, for example, the provincial government funds the supply of drugs to primary healthcare clinics, while their operational cost is capped and funded by the municipality. In order to remedy the imbalance, the NHI (National Health Insurance) scheme was introduced. The NHI, if successfully implemented will enable all South Africans irrespective of their income level access affordable healthcare through a funding system where all employed citizens and permanent residents are contributors [28-29].

2.1.2 Quality Reforms in South Africa

As Dr. Aaron Motsoaledi (former SA minister of health) stated in the National Core Standards (NCS) *'The importance of providing quality health services is non-negotiable. Better quality of care is fundamental in improving South Africa's current poor health outcomes and in*



restoring patient and staff confidence in the public and private health care system. If quality is defined as “getting the best possible results within available resources”, then these National Core Standards set out how best to achieve this’ [30].

The SA healthcare administrators, over the years, have developed quality standards, an array of policy interventions, training and new quality improvement systems have also been implemented in the public health sector [22][31-32]. These include policies on quality healthcare, the National Core Standards, the SA guidelines on clinical governance and the National Department of Health (NDoH) Primary healthcare supervision manual [31]. Further, various healthcare improvement audits were deployed to improve the quality of healthcare: the quarterly program in-depth reviews for Primary healthcare clinics, clinical program support, monthly supervisory visits, management development training, quality improvement workshops [32]. Despite all these interventions, the healthcare system remained vulnerable experiencing high-level inefficiency, poor quality and loss of public confidence [22] [32]. Hence, the recent introduction of the ‘Ideal Clinic’ a national quality improvement program designed for infrastructural and operational upgrade of the Primary Health Clinics [33][34].

The failure of interventions is not peculiar to South Africa. As Yurtkuran et al [35] highlighted, until recently, healthcare institutions have applied several quality standards to improve the quality of delivery of services, but those standards failed to produce reasonable outcomes hence the recent integration of lean into healthcare operations. The management at the Ekurhuleni Primary Health District has adopted a strategic approach to dealing with quality improvement by introducing training on lean management to clinic managers.

Lean requires a radical transformation in operations, a paradigm shift from the traditional batching and mass production peculiar to manufacturing [36]. Lean management in healthcare demand best practice in medical care, proven quality management practices and techniques that improve service delivery by enhancing operational flow for the purpose of system optimisation (best customer value) through waste avoidance or minimisation [8][25]. When implemented meticulously, lean is a methodology that drives knowledge sharing and increased customer value creation through a continuous search for improvement [17].

2.2 Organizational lean readiness evaluation

Lean readiness evaluation is an analysis to obtain a status quo on the extent of availability of preparatory elements for a lean journey. It is a risk minimization process, done before implementation to secure the certainty of success. Organizational readiness has been defined as *“the ability of the organization to undergo a smooth transformation to respond to the changing needs and expectations of its internal and external environment”* [4]. The organization's change management culture influences its response and adaptation to change [10] [37].

A hospital's lean readiness index is a measure of their competency and capability in terms of the critical success factors identified as necessary for a lean journey. It is an assessment of a hospital's ability to exploit the opportunities provided by lean [38].

2.3 Lean readiness factors

The major readiness factors indicated in literature include, prevalence of quality improvement culture (openness); strong leadership support and participation; understanding demand, capacity and customer requirement; employee involvement - training, development; Knowledge of lean principles, tools and structured problem solving [10] [25] [38] [39] [40].

Previous studies also identified knowledge of potential benefits of lean as an important factor that can influence the willingness and readiness of employees to accept lean as a process improvement philosophy [41] [42]. Lean adoption requires an orientation, change of mindset, and willingness to relearn new systems, most times both at an individual and institutional



level. Hence, readiness to accept lean is also a function of the institutional change management efficacy and professional culture which influences the people's resistance to change [4].

Sustainability in the deployment of lean mechanisms depends on the understanding of an organizational operational context. A focus on lean tools and techniques while paying less attention to the readiness of implementers will undermine the sustainability of the lean system [43] [10].

2.4 Major blocks of the Lean readiness framework

The lean readiness evaluation tools deployed in this study is inspired by the works of previous researchers [4] [6] [7] [40-41] [44-47]. Although this study is informed by theoretical constructs contained in the above-mentioned models, the study draws insight from practical applications and interpretation from healthcare in operationalising the constructs. Evidence from operations management literature suggests that the application of lean principles and tools differs between the manufacturing and service sector, hence, [46] [47] [6] were found relevant as they address critical lean readiness factors related to healthcare. There is no 'one fit for all' implementation strategy when it comes to healthcare innovation [18].

2.4.1 Resource availability

According to statistics, only about 18% of the South African population have medical cover [48]. Hence, a high dependency on public-owned healthcare institutions for medical treatment. There is a considerable difference in resource availability between the South African private and public healthcare sectors [49]. For example, the nurse-to-population and doctor- uninsured population ratio in the public sector has been decreasing significantly over the years as most of these professionals are opting to work in the private sector [50]. Evidence from recent South African healthcare literature on constraints of quality improvement show that many public healthcare institutions are less likely to implement quality reforms due to resource constraints [31][33] - workload, staffing crises, poor infrastructure, funding and inefficient distribution of resources amongst levels of care within the public sector [50].

2.4.2 Lean awareness among different institutions

Many studies maintain that the knowledge of lean tools, practices, and benefits paves the way for a deeper understanding of lean and buy-in of both managers and employees [42][40]. Organisations need to train on lean tools, principles and requirements; thus they can identify specifics that are adaptable to their operational context so that they able to apply them with proficiency to achieve a sustainable lean transformation. SA hospitals are involved in several quality improvement initiatives, consequently, a high level of lean awareness is expected.

2.4.3 Lean Principles

Application of lean involves five basic principles namely [8] [51]:

- I. Define value from the customer (both internal and external) perspective.
- II. Map the value stream and eliminate all waste.
- III. Develop tight sequential flow of value-creating activities to enable smooth product flow to the customer.
- IV. As the flow is introduced, let the customers pull value from the activity flow upstream, shortening the lead time.
- V. Start the process again until perfection is reached.

Although the five steps principles were originally proposed for manufacturing, the five principles model has found application in the service sectors including healthcare.



2.4.4 Lean tools usually applied in healthcare

Many lean tools and techniques exist in literature, but the Value Stream Mapping (VSM), 5S, Standardized Processes, Observation Forms, Visual Controls, and root cause analysis are predominantly applied in the healthcare lean systems [16] [39]. Although literature emphasised understanding and application of lean tools and practices, Mutingi et al. [53] suggest that applying the right lean tools at the correct time is necessary to achieve the required success. Effective application comes with knowledge of lean tools, which is informed by appropriate hands-on training.

2.4.5 Quality management practices

Previous research suggests that certain quality management practices and operating environments enable the implementation of lean systems [41]. Also, the absence of such sound practices and environment undermines lean implementation and sustainability. The current study has identified, through a review of healthcare literature, quality practices in healthcare that complement the implementation of lean and practices that are essential for a sustainable lean system. The quality management practices in this study are classified under organizational culture, operations process and planning, coordination and control and quality practices as found within different stakeholder groups (top management, employees, patient/customer group, suppliers) which are needed for lean [9] [7] [30]. The National Core Standards domains: operational management, patients right and safety, cooperate governance and leadership, facility and infrastructure. Also included were the items in the SA ideal Clinic model [34]. The SA Ideal Clinic Model demands the provision of adequate staff level, medicine and other supplies, good infrastructure, sound administrative processes, supplier collaboration and use of automated procurement and stocking system, stakeholder support, and accurate application of clinical guidelines, protocols, and policies [34]. The essence of quality improvement in healthcare is mainly to enhance quality outcomes especially quality of care for patients. This requires a culture of patient-centered care where service and process redesign is anchored on identifying understanding and prioritizing patient/customer requirements.

2.4.6 Organizational Quality management culture

Many authors emphasized the relevance of conducive organizational culture as a necessity for successful lean healthcare implementation [4] [9] [56]. Further, Bhasin [54] maintain that any innovative strategy including lean, irrespective of its strengths, would not gain acceptance if such innovations does not resonate with the organizational culture. Lean culture emphasizes safe environment for both patients and staff [55], waste elimination and respect for people [56]. Managers who champion lean culture provide mechanisms that enables continuous open conversations about waste, front line staff are encouraged to provide management with information on improvement opportunities found in their line of duty, people feel free to report errors and unsafe working conditions without fear of being victimized. Medical staff are trained on patient safety as all patient treatment processes must be void of any harm or any sources of danger [57] [55]. Taherimashhadi & Ribas [58] developed a lean culture model for assessing national and corporate culture adaptations to close organization cultural weaknesses and have the organizational culture aligned to the lean culture. The model consists of six dimensions four of which were found to be of high relevance - willingness to accept change; employee empowerment, low employee turnover, teamwork, equal treatment for all; performance orientation; and long term success perspective [58].

2.5 Conceptual framework

The LRF presented in Figure 1 was developed from the concepts discussed in the broader study, which has been summarised in sections 2.1 - 2.4 of this paper.



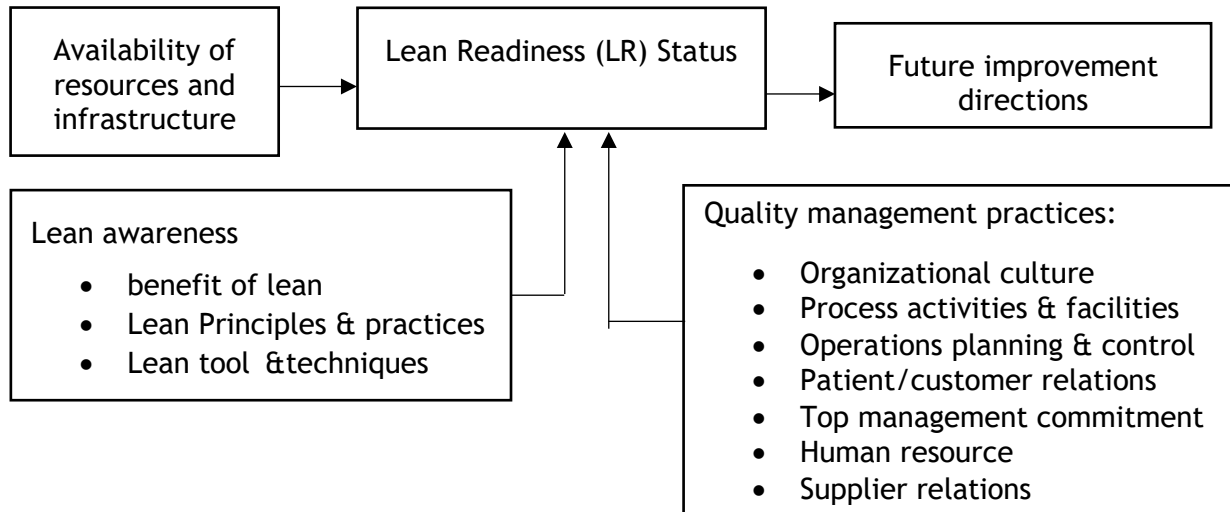


Fig 1: Conceptual framework

3 METHODOLOGY

The lean readiness framework and supporting questionnaire presented in this study were developed through a review of global lean healthcare literature. Further, South African lean and healthcare quality improvement literature was extensively reviewed [27] [30] [31] [33] [34] [49] [59]. Thus, reflecting operating characteristics prevailing in the South African health scenario in the light of current best quality management practices [30][34].

Figure 2 describes the Steps used for the theoretical development of the questionnaire.

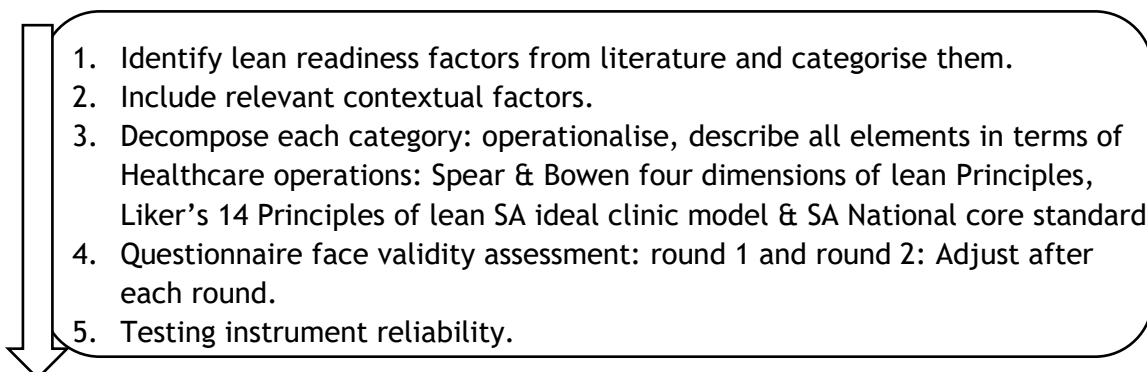


Figure 2: Questionnaire design: Steps used for theoretical development.

The developed questionnaire was reviewed in rounds of panel sessions consisting of lean experts, academics from South African universities who have published on healthcare quality, quality improvement consultants who have pioneered various quality improvement projects in the South African public healthcare system, and focus groups of clinicians from various hospitals. The reviews focused mainly on CSFs for lean implementation in healthcare, lean related quality management practices, technical and contextual issues [25] [34] [38] [39] [41] [45].

The review and discussions enabled the researchers to identify current best quality management practices, capabilities, resource requirements and other contextual factors that are essential to creating a healthcare system that is supportive of lean.

The study seeks to overcome the gaps of the previously developed models as outlined above by asking questions on resource levels, lean waste, placing more emphasis on quality management practices that enable lean, including lean tools and principles and practices, assessment of lean awareness levels in the healthcare sector. The framework further explores hospitals' operations and practices with respect to patients and customer relations; suppliers; top management commitment; employee empowerment and reward systems: training, behavioural and technical skills, use of scientific problem solving; quality improvement culture.

The questionnaire developed has four main sections. Section I deals with participant biographic information, Section II - hospital information, Section III - lean awareness and Section IV - Quality management practices required for lean. As per the questions that test the respondent's perception, the range of choice is a 5point Likert scale to obtain a holistic view on the respondent's level of perception or agreement.

Although an effort was made to separate items/questions and group them under specific construct, a critical standpoint reveal the interwoven and interrelations between the constructs. For example, patient-centered care cuts across employee relations, quality culture, top management disposition of organizational resources to enable employees to acquire the required training, provide infrastructure and other resources needed. One can observe the need for collaboration and the total commitment of all stakeholders to make the lean intervention a success.

The next phase of this study is to administer the instrument to clinicians in three large South African public healthcare institutions, two private hospitals and seventeen primary healthcare clinics from whom permission has already been obtained. This empirical study will test the practical application of the instrument to determine construct validity, reliability and internal consistency. Further, data reduction (by eliminating variables of low significance) using Factor analysis is feasible.

4 CONCLUSION

Lean is a strategic quality management philosophy that has the propensity to drive healthcare transformations. Application of Lean thinking in hospital management offers leaders many possibilities for establishing professional, customer/process-driven health care organizations. Lean is not a quick fix to operational inefficiencies; it requires thorough preparation, steady, continuous, and holistic involvement over a long time. Understanding the complexities provided in this study will provide evidence for informed planning to enable effectiveness in lean initiation and sustainability among clinical communities in South Africa.

Assessment of lean systems is not a once-off event. The process may be iterative and repetitive as contexts changes and new barriers emerge. Healthcare institutions can evaluate their capabilities before a lean journey by using the Lean readiness framework developed in this study. The application of this framework will provide a platform for hospitals operating within a similar context to benchmark with emerging lean success stories.

Further studied to empirically investigate preparedness challenges and the extent of readiness of South African healthcare institutions for lean is recommended.

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6 APPENDIX LEAN READINESS QUESTIONNAIRE:

SECTION I: RESPONDENT BIOGRAPHIC INFORMATION

Gender, Age, Years of experience, Current job position, Current hospital unit employment, highest qualification

SECTION II: HOSPITAL STATUS INFORMATION

Hospital level, teaching status? ISO9000 Certified? Lean status.

Item No.	Please rate the hospital in terms of the following resources:	Very poor	Poor	Average	Good	Excellent
S1	Reliable essential supplies	1	2	3	4	5
S2	Infrastructure	1	2	3	4	5
S3	Efficient back-up electricity supply	1	2	3	4	5
S4	Reliable water supply	1	2	3	4	5
S5	Adequate medical waste disposal	1	2	3	4	5
S6	Staff level	1	2	3	4	5
S7	Internet, communication tools	1	2	3	4	5
S8	Automated patient database	1	2	3	4	5
S9	Doctor to patient ratio	1	2	3	4	5

SECTION III: LEAN AWARENESS



1. According to your understanding, what is Lean management (Mark all applicable)

Application of lean tools for improving operations	1
Continuous improvement philosophy	2
Long term “cost-cutting” philosophy	3
A fully integrated management system	4

2. Which of these lean tools do you use in this hospital? (Mark all applicable).

Observation charts	1	Value Stream Mapping	5
Standardized Processes	2	5S	6
Poka-Yoke	3	None of above	7
Root Cause Analysis	4	Other specify _____	8

3. Perception on lean implementation benefits: Which of the following benefits could be achieved by this hospital if it adopts Lean management? (Mark all applicable).

Increased profit	1	Waste Reduction	5
Decreased inventory	2	Reduced patient waiting time	6
Improved quality of care	3	Increased staff satisfaction	7
Improved productivity	4	Other specify _____	8

4. Below are some indicators hospitals use to measure performance. On a five-point Likert scale, Please rate this hospital in terms of the following:	Very poor	Poor	Average	Good	Excellent
PI01. Patient waiting time	1	2	3	4	5
PI02. Number of recorded adverse events	1	2	3	4	5
PI03. Number of patient complaints	1	2	3	4	5
PI04. Patient throughput	1	2	3	4	5
PI05. Patient satisfaction	1	2	3	4	5
PI06. Financial management	1	2	3	4	5
PI7. Reduction in cost of inventory/ waste reduction	1	2	3	4	5

SECTION IV: QUALITY MANAGEMENT PRACTICES

Item No.	1. ORGANIZATIONAL CULTURE: To what extent do you agree with the following statement regarding the status of quality culture in this hospital? Using a scale of strongly disagree(1) to strongly agree (5)
QC01	In this hospital, we understand that change is usually needed to improve care.
QC02	Organizational culture is open and organic such that employees feel free and valued.
QC03	In this hospital, organizational resistance to change is a challenge.
QC04	The hospital tracks progress made toward attaining hospital-wide quality objectives and communicated such achievements regularly to all clinical staff.
QC05	QI project outcomes are communicated to all personnel.
QC06	If progress made toward attaining hospital-wide quality improvement (QI) objectives is not adequate, corrective action is taken.



2. PROCESS ACTIVITIES & FACILITIES	
Please indicate the level of implementation in this hospital using a scale of: Never=1, Very Rarely= 2 , Sometime=3, Frequently=4 , Always=5	
PR01	In this hospital each unit has a specific task
PR02	In this hospital related procedures are situated close to each other
PR03	This hospital keeps all workstations clean
PR04	Stores equipment and tools are in appropriate place after use
PR05	This hospital labels and locates each piece of equipment in the right place within the unit
PR06	Uses demand from next internal customer to provide operations at each site
PR07	Hospital infrastructure is maintained
PR08	This hospital has a dedicated manager in each unit
PR09	Displays equipment maintenance checklist
PR10	Manages flow of materials, processes and people well
PR11	Has work instructions and configuration settings for each piece of equipment
PR12	Trains staff on how to use new equipment

3. OPERATIONS PLANNING, COORDINATION AND CONTROL:	
Please indicate your perception on the level of implementation of the following in this hospital. Rank the hospital using a scale of: Never=1, Very Rarely= 2 , Sometime=3, Frequently=4 , Always=5	
PC01	Organise focus groups of employees for quality improvement (QI)
PC02	Quality circles submits new ideas and solutions to management for action
PC03	Benchmarks are performance against best-performing local hospitals
PC04	Benchmarks are performance against best-performing international hospitals
PC05	Uses evidence-based clinical practice guidelines
PC06	Implements specific disease or condition quality improvement programmes (for example chronic illness registries and planned care for chronic diseases).
PC07	Use Standardises patient care processes and procedures
PC08	Provides standard operating procedure through a mobile application
PC09	Provides patient and operations records online
PC10	Records accurate data
PC11	Synchronises data across departments
PC12	Harmonises work processes across departments and workgroups
PC13	Has zero out-of-date practices
PC14	Uses problem-solving techniques such as fishbone diagrams
PC15	Displays up-to-date charts showing error rates, progress and next job activity

4. PATIENT/CUSTOMER RELATIONS: Please use the following scale	
1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree	
CUR01	In this hospital, there is an awareness of “what is value to the customer/patient”.
CUR02	Patients and families are involved in efforts to improve quality of care.
CUR03	The relationship between employees and patients is characterized by mutual respect.
CUR04	Patients are aware of their treatment life cycle (end to end treatment process pathway)
CUR05	Patients are provided with timely feedback on their health status.
CUR06	The hospital has strategies to improve patient waiting time



Item No.	5. TOP MANAGEMENT COMMITMENT Please indicate to what extent you agree with the following management related attributes are evident using a scales of 1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree
LMG01	In this hospital, leaders “walk-around” to identify problems or issues relating to quality
LMG02	In this hospital leadership support employees in the (QI) journey.
LMG03	Management is first trained on QI before others.
LMG04	Top management is committed to QI
LMG05	Leadership institutionalises dedicated QI positions like quality managers, quality assurance officers.
LMG06	Management adopts a systems approach in QI.
LMG07	The organizational strategic agenda (mission and vision) is aligned with the QI objective.
LMG08	Leadership encourages and coaches staff on QI.
LMG9	Management invests in QI training programs.
LMG10	Management encourages use of external experts/consultants to evaluate quality management processes

Item No.	6. HUMAN RESOURCES (knowledge, skill, attitudes and behavior, working conditions) To what extent do you agree with the following employee related attributes? Please use the following scale 1= Strongly Disagree 2= Disagree 3= Neutral 4= Agree 5= Strongly Agree
H01	Employees are encouraged to identify areas of improvement in their jobs.
H02	Staff development needs are identified
H03	This hospital ensures patient safety
H04	This hospital ensures employee safety.
H05	Employees have sound knowledge of both external and internal customer groups
H06	Employees are skilled and knowledgeable enough to contribute to problem solving.
H07	Employees are encouraged to report errors committed or observed to their unit manager.
H08	Workers are encouraged to stop any process if there is a tendency for adverse events.
H9	Admin processes are efficient.
H10	All job positions are occupied by qualified personnel.
H11	Employees have the competency to perform different tasks.
H12	Employees have a clear understanding of their job description and requirement.
H13	Employees regularly undergo quality training to develop competences for problem-solving and waste identification.
H14	Employees are conversant with hospital policies, systems and functional areas.

Item No.	7. SUPPLIER RELATIONS: Rank the hospital in terms of the following using a scale of: Never=1, Very Rarely= 2 , Sometime=3, Frequently=4 , Always=5
SU01	A clear mechanism is in place to evaluate our suppliers
SU02	Local suppliers are used where possible to avoid transportation delays.
SU03	Supplies are according to hospital strategic and operation needs.
SU04	Suppliers to this hospital consistently provide goods and service of high quality.
SU05	We have database of approved suppliers and service providers.
SU06	We use mobile phone stocking tool.
SU07	We have efficient supply-chain management.
SU08	Suppliers maintain long term cooperative relationship with the hospital.

