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An Overview of the Performance Improvement Initiatives by the Ministry of Health in the Kingdom of Saudi Arabia

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Abstract

Saudi Arabia's Ministry of Health (MOH) use corporate performance improvement methodologies to develop and implement performance improvement initiatives designed to continue building on the Ministry's vision of transforming hospital operations and instituting a culture of quality and performance focused on the "patient first" principle. We evaluated the feasibility of setting up a performance improvement unit (PIU) within the MOH to apply the principles of Lean Six Sigma and to change management methodologies. The MOH collaborated with external consultants to implement PIU initiatives in 4 steps: PIU Setup, PIU Capability Building, High-Impact Project Implementation, and Project Sustainability and Knowledge Transfer. PIU units were setup across the 13 provinces over 90 days. The process included the promotion of knowledge sharing to strengthen the skill set of Saudi health care professionals and develop local performance improvement champions within the MOH who could lead, implement, and sustain future projects. Implementation was a challenge; though, early results from the High-Impact Project Implementation phase were encouraging. However, the sustainability of PIU interventions was poor, with performance improvement processes returning to baseline levels within 9 months. This case study shows that PIU implementation is a feasible approach for improving health care delivery in Saudi Arabia. Poor sustainability despite initial success highlights the need to further improve the engagement, incentivization, and training of team leaders and members to achieve long-term success with the program.

Keywords

performance improvement, health care systems, lean, public health sector, health care policies

Background

Health care costs have been increasing at an alarming rate worldwide, and a significant portion of these costs can be attributed to operational inefficiencies associated with direct medical service delivery processes and administrative aspects of the health care system.[1-3] It has been estimated that more than half a trillion dollars per year are spent on costs associated with the "overuse," "underuse," or "misuse" of health care resources.[4] Therefore, instead of reducing value-added care by reducing payment levels, benefit structures, and eligibility, a less harmful and more efficient strategy of containing health care costs is directed at reducing "waste" of resources.[1] Given the current situation of "broken" health care processes and system failures, it is not surprising that the health care sector is mired in deep crises related to safety, quality, cost, and access that pose serious concerns to the health status and function of many patients.[4,5] It has been reported that on average, about 98 000 deaths and about 1 million injuries that occur in the United States on an annual basis can be attributed to various types of health care system inefficiencies.[6]

In response to the escalating costs of health care, and in an effort to overcome the barriers to delivery of high-quality care, the Institute of Medicine (IOM) report identified 6 interrelated dimensions of quality (safe, effective, patient-centered, timely, efficient, and equitable) for improving the health care system.[4] "Patient centeredness" was identified as a guiding principle for redesigning and improving health care overall and for achieving performance goals.[4] This patient-centered approach provides a compelling case for increasing collaboration between medicine and engineering methodologies (methods used in industrial sectors, mostly in manufacturing) in health care delivery, and it offers a road-map to transform the existing system. Health care systems

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Table 1. Number of Hospitals and Trained Medical Staff in the KSA.[23]

Indicator	Number
MOH hospitals	244
Private hospitals	125
Doctors	18 086
Nurses	44 719
Beds[a]	45 110

Note. KSA = Kingdom of Saudi Arabia; MOH = Saudi Arabia's Ministry of Health.
[a]Capacity of MOH and private sector beds alone.

across the world, especially in countries like the United States, Canada, the United Kingdom, the Netherlands, and so on, are adopting existing systems-engineering tools, such as process optimization, lean process, reduced waste, and performance improvement initiatives to redesign health care processes at various levels of the delivery system. These tools have been successfully implemented to improve and sometimes transform manufacturing, engineering, and other service industries, such as those at General Motors, Wal-Mart, and Boeing, to name a few.[7-9]

Lean and Six Sigma are the 2 most popular approaches in the industry, as they provide a roadmap to facilitate the adoption of process innovations. Lean focuses on "reducing waste," whereas Six Sigma deploys a 5-phase framework—define, measure, analyze, improve, and control—as a problem-solving strategy.[10] An integrated data-driven approach of Lean Six Sigma (LSS) has been typically applied in the health care sector.[11,12] Studies have shown that the LSS approach in health care can reduce complexity when hiring personnel; improve operating theater starting times; reduce emergency room (ER) lead times, patient waiting time in the outpatient department, diagnostic result turnaround times (TATs), and patients' length of stay; and improve a maintenance system to manage mechanical breakdowns and irregularities such as billing or medication errors and delinquent medical records.[7,12-18] Increases in operational efficiency and effectiveness as a result of quality-improvement initiatives can lead to a reduction in health care costs due to better outcomes.

Many health systems and organizations in the developing and industrialized nations have benefited from the use of performance improvement techniques. For example, hospital systems have reported an increase in patient perception of quality of care and increase in savings achieved via multiple mechanisms including reductions in patient waiting time, ER lead time, average length of stay, and hospital readmission rates.[13,19-22]

The Ministry of Health (MOH) primarily manages the health care sector in the Kingdom of Saudi Arabia (KSA). The MOH is responsible for regulating health care delivery and providing free health care to 28 million residents across 13 different provinces (Table 1).[23] In addition, private sector operators also play a key role in providing specialized treatment facilities. The vision of MOH is to deliver high-quality, integrated, and comprehensive health care services. The MOH also develops laws and legislations that regulate both the governmental and private health sectors. To address the rapidly increasing demand for health care services, the government has been steadily increasing its health care budget over the last decade, to 3.2% of gross domestic product (GDP) in 2012 (World Bank[24]) and 19% of total government spending in 2015.[25] Despite improvements in health care facilities across the Kingdom,[26] there are a number of issues that pose a challenge, such as a shortage of skilled health care professionals, limited financial resources, changing patterns of disease, high demand resulting from free services, an absence of a national crisis management policy, poor accessibility to some health care facilities, the lack of a national health information system, and the underutilization of potential electronic health strategies.[27] Cross-sectional studies from hospitals in the KSA have shown that patients perceived a significant gap in the outpatient service quality[28] and were dissatisfied with the service at primary health care clinics when waiting time exceeded 30 min.[29]

The MOH initially adopted a wide array of standardized health care performance improvement plans, as developed by the Agency for Healthcare Research and Quality and successfully implemented in the United States, to enhance health care sector competencies and the performance of its facilities in KSA. The goal was to create a culture of quality by emphasizing the "patient first" paradigm. However, a lot of skepticism emerged when this intervention was designed. This was largely because of a lack of motivation systems for workers or administrators due to the 100% public structure of health care at the Saudi MOH wherein all workers are salary based and budgets are based on actual bed numbers and not on performance or volume. Furthermore, there was an absence of quality measures or key performance indicators (KPIs). In response to the overwhelming patient and administrator dissatisfaction regarding the hospitals' performance, the quality and development teams at the MOH decided to develop and implement performance improvement initiatives based on corporate performance improvement methodologies.

The end objective of this initiative was to ensure the development of a performance improvement unit (PIU) within MOH directorates. This unit would be responsible for transforming hospital operations by implementing best clinical practice processes and patient pathways with a focus on skill transfer to localize and embed a performance-enhancing culture of safety, effectiveness, patient centeredness, and timeliness. The other crucial objectives appointed to this unit were as follows: to achieve cost efficiency and raise the quality of work processes, thus maintaining patient satisfaction, and expanding the scope of specific medical services to cover as many people as possible over multiple years.

Methods

The performance improvement program within the MOH was developed using an integrated approach using LSS

methodologies. Three primary domains of care—clinical outcomes, clinical processes, and patient experiences—were chosen. Clinical services were selected based on the most complaints that were received and the largest delays (medical delivery services, surgery wait times, and specialist referral wait time); nonclinical (administrative) areas were also selected for the program.

To establish, implement, and sustain local performance improvement programs across various hospitals in the Kingdom, the MOH collaborated with external consultants to develop local capabilities via knowledge sharing and training in LSS methodology to health care professionals and staff members across various hospital settings in the KSA. The consultants worked closely with the internal teams from the MOH to build necessary internal capabilities and processes to improve hospital performance. The consultants conducted the following *steps* as a means of laying a foundation for the success of the performance improvement program.

Step 1: PIU Setup

This step involved developing the PIU's structure and outlining its operational cycle and operating manual, creating a shared need, and shaping the unit's mission, vision, and core values, as well as its policies and procedures.

Step 2: PIU Capability Building

Staff training on LSS principles, process-level value stream analysis, rapid improvement workshops, leadership skills, project management skills, change management, and ongoing data reporting were provided via a variety of didactic lectures, hands-on demonstrations, role playing, open discussions, and the training of internal coaches. As the program aimed to expand and include hospitals in the 13 KSA provinces and local health areas, the central-level PIU team, along with the external consultants, made a concerted effort to identify and train local health professionals who would lead local PIU efforts, train others in performance improvement techniques, and coach quality-improvement teams. These individuals were drawn not only from MOH regional and area offices but also from universities; they included health workers, such as clinicians, nurses, ward clerks, technicians, and other support staff.

Step 3: High-Impact Project Implementation

The PIU team incorporated a "systems perspective" to identify and prioritize improvement opportunities within individual hospitals, as well as to form project teams and to work on project implementation within 3 main capacities—namely, the main lead, co-leads, and team members. The main lead (the consultants) and the co-lead (the main MOH PIU) worked together to generate the tasks and the objectives, define the KPIs, and educate and monitor execution by the team members (local hospital teams). The team members were given all the groundwork and were taught to implement and execute the tasks put together by the consultants.

Step 4: Project Sustainability and Knowledge Transfer

To achieve sustained improvements, it is essential that the risks associated with human failures are minimized. Continuous team training provides a unique approach that can facilitate performance improvement, which focuses on human behavior and helps to identify the ways in which risk can be mitigated through enhanced communication and more effective teamwork. Therefore, this phase involved (1) collaboration across various departments of the MOH (information technology, technology, accreditation, clinical education and training, etc) and hospital project teams; (2) sharing of knowledge across functional areas of expertise by program managers and project management teams; (3) monitoring progress before, during, and after the change process; and (4) continuous training in performance improvement and change management to ensure program success and momentum.

After implementation and execution, program feasibility and performance was determined by an independent team from the MOH main office in terms of significance of improvements, sustainability, and effects on health outcomes, costs, and staff satisfaction. The performance improvement tools used by the MOH included standardized plans that provided a structured approach to measuring performance, implementing change to improve performance, and measuring resulting outcomes.

Results and Discussion

Step 1: PIU Setup (30 Days)

With Steering Committee approvals, performance solution staff members helped form project teams, and they identified various staffing levels with the provision of a detailed description of the required job qualifications and responsibilities, identifying the space, technology, and training needs for the unit to operate at an optimal level. Interviews were conducted to identify team members based on 4 criteria: (1) commitment toward PIU, (2) understanding of operating theater and ER work environments, (3) understanding of weaknesses in the existing system, and (4) leadership traits. After recruiting the team members, work responsibilities were reviewed and training modules were tailored for all team members. The target performance level for each team member was identified by reviewing the job description during the interview. (Essentially, we matched the list of activities needed to be done by the candidate with the current skill sets and defined the needed extra education; for example, data collection responsibility was given to someone who had done this work previously as part of their research studies in school or on the job. At the interview stage, the team asked

questions regarding the data collection skills of the candidate and worked with the candidate to define the missing parts to be covered by the educational program.)

Step 2: PIU Capability Building (90 Days)

The improvement initiatives derived from these trainings were brought to the MOH and hospital board room team meetings for the purposes of sharing, learning, and advocating for quality, thereby assisting in identifying future areas/projects for improvement. This proved to be a vital strategy for rapidly extending quality-improvement activities throughout the country. The training program developed several modules on LSS methodology, data collection, recording, and data analysis; on-the-job training was provided to selected team members. Thus, the provision of formal certification on LSS methodology was not possible given the tight working hours and difficulty in obtaining legal approval for time off work, as governed by the work civil code for these workers; hence, we briefly focused on those modules that were considered most relevant. Training was provided to qualified individuals who were members of the core project team, and to the team members in charge of identifying gaps and deficiencies in the existing workflow, initiating operational interventions to improve targeted practice, understanding KPIs, and measuring and tracking the effects of these interventions.

Step 3: High-Impact Project Implementation (90 Days)

This process allowed the PIU staff to gradually develop the skills required, to a point where these individuals were able to function independent of external consultants. On an average, the learning curve was observed to be 1 week. As a part of the initial "high-impact" implementation phase, the PIU team helped optimize operating room and emergency department (ED) efficiency. The high impact items were identified by the administrative and performance improvement teams, with a focus on improving patient care. For example, the impact items and data for major KPIs, such as waiting time for operating room and transfer time for labs in ED, were displayed on large dashboards near the reception of the operating room/ED for visual performance management. Process optimization was monitored by reviewing the KPIs and tracking their completion and improvement over time.

Step 4: Project Sustainability and Knowledge Transfer (30 Days)

Through collaboration across various departments of the MOH (information technology, technology, accreditation, clinical education and training, etc) and hospital project teams, effective communication channels were established to allow sharing of knowledge across functional areas of expertise by program managers and different project management teams. By monitoring progress before, during, and after the change process, and continuous training in performance improvement and change management, the program success and momentum was measured. However, the short follow-up duration of this stage did not allow us to collect definitive data for measuring sustainability.

As an example of the program initiative, the performance improvement processes that were implemented within the ED at a tertiary care center with a bed capacity of 1800 in Riyadh are briefly outlined below.

Case Study: PIU Initiatives in ED of a Tertiary Care Center

The PIU initiatives within the ED were started and implemented in 3 months, and they broadly involved stakeholder analysis, an initial assessment of those areas requiring improvement, project planning, and team identification and training. The program's steering committee within the PIU approved the program and monitored improvements in the following key areas:

1. Enhanced performance of the Triage, which was achieved by opening breakthrough lines of communication between the ED staff and those from the surrounding primary health care centers. This resulted in the approval to assign a new primary health care center to which the ED can refer 4 to 5 cases on a regular basis during work hours. Furthermore, the taskforce, which involved the ED and the supply department, ensured the timely attainment of vital ED equipment.
2. Identified the need for critical clinical pathways and created one for acute ST segment elevation myocardial infarction (STEMI; Online Appendix). Table 2 outlines some of the main components that were captured in the acute STEMI clinical pathway.
3. Worked on reducing the ED lab test TATs. To achieve this objective, the taskforce updated the STAT (immediate) test list to cover the real needs of patients and to decrease the abuse of STAT tests. A mobile phone for laboratory staff was provided to ensure timely communication with the ED clinical staff with respect to panic values or other urgencies. The taskforce developed a new ER lab departmental policy for TAT&STAT lab lists, along with a way to prioritize the samples by means of a color-coding system. Furthermore, the taskforce developed a laboratory sample tracking form and initiated regular phlebotomy training sessions to address vital phlebotomy skills, as well as other lab-related matters.

Challenges. The performance improvement initiative faced several challenges. The time taken to identify leaders within the MOH directorates and hospitals was longer than anticipated. It was also difficult and time-consuming to bring the civil labor

Table 2. Main Components Captured in the Acute STEMI Clinical Pathway.

Care on arrival in the ER	ECG, acetylsalicylic acid (at home, in ambulance, not given), reasons for contraindications to acetylsalicylic acid
Laboratory investigations	PT, INR, PTT, RBS, urea, creatinine, etc
Treatment and medications for: immediate pain relief administered within the first hour, and after admission	Morphine, clopidogrel, enoxaparin, heparin, beta blockers, etc
TIMI score	Age >65 years, ≥3 risk factors for coronary artery disease, the use of acetylsalicylic acid, severe angina, etc

Note. STEMI = ST segment elevation myocardial infarction; ER = emergency room; ECG = electrocardiography; PT = prothrombin time; INR = international normalized ratio; PTT = partial thromboplastin time; RBS = random blood sugar; TIMI = thrombolysis in myocardial infarction.

MOH members on board, as they perceived the incentives to be abstract (e.g., "to provide better care"). Training in LSS was not comprehensive as it was provided on-the-job due to the difficulty in obtaining legal approval required for time-off, as governed by the work civil code for these workers. The involvement of a foreign consultant was also met with criticism, as it was perceived that an outside consultant might have limited understanding of the health system in the KSA. As a result, the adoption of the PIU initiatives was variable in different hospitals, largely based on the level of motivation and engagement of the top management in each hospital. Due to the lack of comprehensive training, leadership changes, and attrition and inadequate follow-through, the performance improvement processes were not sustained and returned to baseline levels within 9 months of implementation.

In this era of increasing hospital expansion and simultaneous cost constraints in health care delivery systems, it is of critical importance to develop robust processes to create sustained performance improvement and monitoring with the ultimate objective of improving clinical outcomes and patient satisfaction.[30] Studies have shown than the delivery of safer, more efficient, and higher quality-patient care requires organizational transformation using not only PIU initiatives but also a more comprehensive management system within a supportive institutional culture with committed leadership.[31] Performance improvement in the health care sector is an ongoing process where activities related to defining, measuring, and improving quality become formally integrated into the structure and functioning of a health care organization or system. The phased processes of the performance improvement program outline the critical aspects and roadmaps required to create a lasting intervention to improve the quality of health care services.

Reflecting on the success of the initial high-impact phase but the lack of sustainability, the MOH has plans underway to continue these efforts and to complete program implementation in the MOH's top 30 hospitals, as well as to integrate these change management tools with the efforts of the Central Board of Accreditation of Healthcare Institutions. The MOH also intends to revisit the first set of pilot facilities on an annual basis and perform subset analyses by subspecialty. Future efforts will assess findings across other subspecialties and identify those factors sustaining realizable and measurable cost savings for patients and the health care sector of KSA.

Conclusion

Our experience with the PIU program shows that it is a feasible approach for improving health care delivery in the KSA. It also highlights the importance of requisite engagement, training and motivation of leadership and management teams as well as local team members, and the adoption of clear KPIs and tangible incentives for sustainability of the program. We expect that the KSA PIU program will also hold significant value for other Middle East and North African countries experiencing robust economic changes, or to the rapidly changing middle-income health care systems of Asian countries.

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