



Factors Influencing Delays of Elective Surgical Cases in Private Health Facilities in Kenya

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Abstract

Delays of elective surgical operations are a major concern for all healthcare institutions and their resolution would be key in reducing wastes and improving workflow efficiency. However, achieving efficiency in the performance of elective surgical cases has been marred by numerous factors especially in the developing world, and Kenya, in particular. This study sought to identify the factors influencing delays of elective surgical cases in three private health facilities in Kenya. The study evaluated patient, staff, equipment and management support factors associated with delays of elective surgical cases. The study adopted a descriptive cross-sectional study design encompassing use of both quantitative and qualitative data. Quantitative data was collected through questionnaires administered to operating room staff while qualitative data was collected through Key Informant Interviews with operating room administrators. Stratified random sampling was applied to select 238 respondents from a target population of 494 operating room staff drawn from the three facilities based in Nairobi (1), Mombasa (2) and Kisumu (3). Two (2) Key informants from each targeted facility were purposively selected for inclusion in the study. Descriptive data was then analyzed using Statistical Package for Social Sciences version 23.0 and the results were presented through mean and Standard deviation. Inferential statistics were calculated using Pearson's Correlation and Multi-Linear regression methods to test the relationship between variables at 95% confidence interval where *p-values of* ≤ 0.05 were considered significant. Qualitative data was analyzed thematically and was guided by the study objectives, and then the results were triangulated with quantitative findings from questionnaires. The results indicate that out of the four factors evaluated, staff and management factors ($X_2: \beta_2 = .074, P < .007$), ($X_4: \beta_4 = .516, P < .000$), had a significant influence on the delays of elective surgical cases in the private health facilities in Kenya, while patient and equipment factors ($X_1: \beta_1 = .034, P > .267$), ($X_3: \beta_3 = .009, P > .841$) did not have a significant influence on delays of elective surgical cases in the private health facilities in Kenya.

Key Words: Operating Room; Performance of Elective Surgical Cases; Patient factors, Staff Factors; Equipment Factors; and Management Support Factors.

Factors Influencing Delays of Elective Surgical Cases in Private Health Facilities in Kenya

1.1 Introduction

1.2 Background of the study

Good population health outcomes rely not only on health protection and health improvement, but on the quality and accessibility of healthcare services provided (Commission, 2012). Health service delivery, according to WHO (2010) is people-centered care that it should be focused and organized around the health needs and expectations of people and communities rather than on diseases. Service delivery is an immediate output of the inputs into the health system, and it is what is visible to the clients. Strengthening service delivery ensures access to quality and efficient interventions leading to improved health outcomes. One of the challenges of service delivery is the delays that patients experience at the various service points. Such delays are a barrier to access of care, and all efforts must be put in place to minimize them. Hendy et al (2012) acknowledges that among the delays are those associated with access to elective surgical services and are major sources of concern for all healthcare institutions.

Globally, there are various health care systems that provide universal or non- universal health care to the people. In the United States of America (USA), ownership of the health care system is mainly in private hands with about 65% of total health care expenditure while Federal, state, and county, governments account for the rest. 38% of the people receive health care through their employers while 17% have private insurance or co-pay arrangements (American Hospital Association, 2018). Among the developed nations the USA is the only one without universal coverage, with 12-16% of the population having no health insurance. Even so, service delivery and health outcomes are said to be good.

On the other hand, Europe is home to some of the best and most established health care systems in the world that provide universal health care (Soliman *et al*, 2013). In many of the European countries health care is centrally financed through taxes and to some extent through service fees. Health establishments and personnel are managed by government ministries. Noticeably, Europe has a reputation for excellent standards of care and service delivery (Orchard & McWinne, 2010).

While there are countries in Africa that have made great strides towards achieving universal health care for their citizens, general performance in service delivery and health outcomes is still low. Many of the African countries have excellent level of care provided by private healthcare facilities which is not accessible to the majority of the citizens owing to cost. Public health institutions face a myriad of challenges which include inadequate human resources, equipment, medicines and supplies. These and other factors affect service delivery, outcomes and patient satisfaction (Subramanian & Rohleder, 2014).

Among the most crucial health services that present serious quality concerns are the surgical services that have been neglected in most healthcare systems in Sub-Saharan Africa, Kenya included. There is limited access to surgical services and accordingly low surgical output compared to richer nations (Ohene-Yeboah & Abantanga, 2011). The reasons for this are numerous, including but not limited to inadequate human resources especially those with expertise to conduct specialized surgical procedures, lack of specialized equipment and limited surgical supplies (Anastasius *et al*, 2011).

1.2 Statement of the Problem

Despite notable successes in strengthening of surgical service delivery in Kenya, delays of elective surgical cases remain a source of concern to many hospital settings across the country (Anastasius *et al*, 2011). These delays act as barriers to optimal patient workflow efficiency and result to piling of scheduled elective surgical cases, wastage of resources as well as dissatisfaction among staff and patients (Wong *et al*, 2010). For hospital administrators, delays of elective surgical cases result in loss of revenue and negative reputation for the organization (Bauer *et al*, 2016).

While there are no internationally acceptable benchmarks on what can be considered acceptable levels of delays of elective surgical cases, the National Advisory Committee of the United States of America has set 59 percent as the bench mark of first cases being wheeled in operating rooms across United States (Anastasius *et al*, 2011). This is to ensure that subsequent cases are also not delayed. Ciechanowicz *et al* (2010), while carrying out an observation from a UK health Centre established that 22% of cases did not start on scheduled time with most of the elective surgical cases starting more than 15 minutes after the scheduled time. A study by Yamuragiye (2019) on

starting time delay in operating theatre at university teaching hospital of Kigali established that only 3% of first surgeries started on time while 97% were delayed.

Maine , Gallaher and Kajombo (2019) carried a study on the effect of in-hospital delays on surgical mortality for emergency general surgery conditions at a tertiary hospital in Malawi , where the study established an increased mortality in OR and advised on increased staffing levels and operating room availability at tertiary hospitals, especially at night, are needed. Another study by Okunu (2012) on cancellation of elective surgical cases at Kenyatta National Hospital established that cancellation of elective cases occupies a substantial population (20.6%) of cases at Kenyatta National Hospital, Nairobi with majority of these cases being due to hospital non-clinical reasons with lack of time being the commonest. These cancellations cause delays of elective surgical cases. The study further stated that 60% of these cancellations were avoidable with better management.

While the reasons for the delays may vary from one facility to another, any delay results in loss of revenue for the health facility and client dissatisfaction with surgical care. Available studies including the above local study are scanty and therefore cannot be considered to be conclusive on the factors influencing delays of elective surgical cases. Moreover, the studies were not based on private health hospitals in Kenya. Therefore, this study specifically seeks to establish the factors influencing delays of elective surgical cases in private health hospitals in Kenya.

1.3 Study objectives

The broad objective of this study was to establish the factors influencing delays of elective surgical cases in leading private health hospitals in Kenya.

1.3.1 Specific objectives

This study seeks to address the following specific objectives:

- a) To determine the patient factors contributing to delays of elective surgical cases in leading private health hospitals in Kenya
- b) To establish the staff factors associated with delays of elective surgical cases in leading private health hospitals in Kenya.
- c) To identify equipment factors resulting in delays of elective surgical cases in leading private health hospitals in Kenya.

- d) To assess the contribution of management support to delays of elective surgical cases in leading private health hospitals in Kenya.

1.4 Literature Review

1.4.1 Theoretical framework

The theory of constraints (TOC) is a methodology that seeks to maximize the potential of any system by investigating its constraints and figuring out the critical ones (Eliyahu & Goldratt, 1984). From there, the system can be safely expanded in directions where the constraints are not at their limit yet, allowing the company to move forward towards improved productivity while remaining within safe margins. It should not be surprising that TOC finds active use in the healthcare sector, and there are various real-world examples of how it has helped transform a facility into a more productive and organized one.

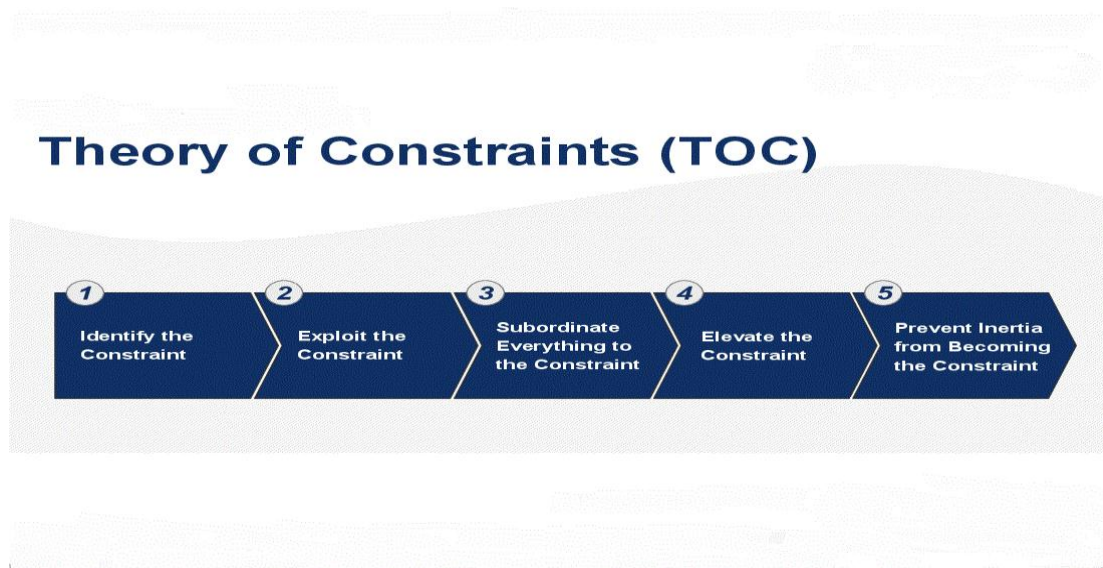


Figure 2.1 Theoretical Framework (TOC)

Theory of Constraints (TOC)

This study is based on Theory of Constraints (TOC), which is a systems theory of extems-management philosophy developed by Eliyahu M. Goldratt in the early 1980s. The fundamental thesis of TOC is that constraints, or bottlenecks, establish the limits of performance for any system. Proponents of TOC suggest that to continuously improve the performance of organizations, it entails identifying constraints and effectively managing them. TOC is a practical

guide for managers to identify what to change in the system, what to change it to, and how to cause the change.

This theory was applied in the identification of factors that affect delays of elective surgical cases in private health facilities in Kenya of Nairobi, Kisumu and Mombasa counties. TOC helped in highlighting the constraints in the system that hinders the organization from achieving surgical services efficiency. This further helped to alleviating the problem and apportioning to it the necessary attention it deserves and the identifying the necessary changes required in the system in order to achieve the desired outcomes.

One of the biggest challenges for healthcare facilities of any scale is the speed at which they can deliver services to their patients. It is not rare for delays of elective surgical cases to extend beyond acceptable time, and this continues to be a major issue in major hospitals. When one looks at this problem as a situation with constraints, it becomes clear that TOC can be a powerful tool for addressing delays of elective surgical cases. The theory of constraints is not a magic wand in quality improvement. It relies on the facility's ability to accurately identify the constraints (in this case patients, management, equipment and staff factors) that are preventing the facility from reducing delays of elective surgical cases in the health facilities. When one is working with patients with varied needs, complicated equipment, large number of staff from different specialties and larger facility, it can become difficult to coordinate and bring the different pieces together in a manner that results in efficient provision of surgical services.

1.5 Factors contributing to delays of elective surgical cases

1.5.1 Patient Factors

Psychological unpreparedness among patients contributes to last minute cancellations. Cancelled cases cause delay in that the surgical teams get prepared waiting for the patient just to learn the patient has called to cancel. In some instances, the patients do not call to cancel; instead they do not show up on the day of the surgery. These two scenarios are a waste of human resources time, and end up delaying the next and subsequent cases.

In other instances, there is a delay in obtaining consent from the next of kin where the patient is unable to sign for themselves. Consent for a surgical procedure and anesthesia is a standard requirement and when this vital document is not obtained in good time it can lead to cancellation of the case, or delays as staff wait for next of kin.

Patients' physical unfitness for surgery is another factor that has also been a cause for delays or cancellations of scheduled surgical operations (Ifesanya *et al*, 2013). During pre-surgery assessments, patients have been found to be unfit for surgery forcing either a cancellation or a reschedule (Van *et al*, 2016). The establishment of a pre-anesthetic clinic for the pre-anesthetic evaluation of the patients by anesthetists and effective coordination of staff has been proved to address these situations.

Callie et al (2016) pointed out that on average an estimated 65 percent of patients booked for elective surgical cases arrive late to their appointment. This can be due to difficulties in transportation from home, or a lack of education and preparation prior to surgery. Research from Duke University School of Nursing shows that hospitals lose \$20 for every one minute of delays of elective surgical cases, and the average delay is about 20 minutes with most delays blamed on patient factors. This would mean that for every 20-minute delays of elective surgical cases, a hospital loses \$400(Jain *et al*, 2015).

A study on operational failures and interruptions in hospital nursing observed that most of the cancellations and delays occurred in outpatient procedures. Day case cancellations accounted for 23% of all elective surgical case cancellations. The delays were mainly due to either patient not showing up or their late arrival to the operating theatre (Kirvela, 2009). Some facilities charge a scheduling fee to patients who do not show up for surgery thus motivating the patients to come for the procedures.

1.5.2 Staff Factors

Staff related factors are other reasons for delays of elective surgical cases in most facilities. Disruptions in workflow resulting from teamwork and staff communication failures have been identified as reasons that significantly contribute to serious delays in the operating rooms and late start of first or subsequent cases (Darwish *et al*, 2016). While it is apparent that some matters

associated with staff performance may be unavoidable, there is much evidence in that effective communication and teamwork among care givers contribute to better patient experience and outcomes (Shouhed, 2012).

The success of elective surgical cases in every day which depends largely on outcomes of the day's first surgical cases is highly dependent on availability of the staff involved in the whole surgical process. Having adequate number of staff in their right mix staff is crucial in maximal utilization of the surgical services which requires on-time starts and efficient room turnover (Callie, 2016). Availability of the necessary staff is crucial in the delivery of surgical services in health facilities. A study done in China revealed that unavailability of the required staff to conduct operations was the main reason for cancellation, delays and postponement of surgeries (Zhao & Yeung, 2011). In fact, 11% of patients were delayed or cancelled due to unavailability of surgeons, anesthesiologist, nurses and other support staff required to deliver effective surgical operations.

Jonnalagadda and Hariharan (2012) evaluated the reasons for cancellations and delays of surgical procedures in developing countries where the study established that 89% of cancellations occurred in patients undergoing elective surgery and the leading reasons were staff related which included improper pre-operative staff preparation (13%), unavailability of nurses (11%) and anesthetists (8%). Another study by Khan *et al* (2016) established that preoperative briefings reduce unexpected delays in the surgical cases by 31% and decrease the frequency of communication breakdowns that lead to delays.

Health care in Africa faces difficult challenges such as shortage of health workers, increased caseloads for health workers due to migration of skilled health personnel, and the double burden of disease which affect the general health care provision in health facilities. Major services such as surgical services have been faced with shortage of staff resulting from high turnover, brain drain in the sector as health professional seek greener pastures overseas, low motivation of health workers and overall inadequate human resources (Anastasius *et al*, 2011).

Many health facilities have continued to report late starting of cases due to laxity of staff in these facilities. Wysocki (2014) while carrying out a study on the challenges for health care

organizations in Uganda, through observation of surgical procedure in public hospital in the country established that there are cases where lead surgeons or anesthetists are unavailable to start operations. Okunu(2012) also established that laxity and lack of commitment among surgical staff in health facilities, especially public health facilities is a matter of concern globally and more so in developing countries like Kenya.

1.5.3 Equipment factors

The other frequent organizational factors associated with operations delays are due to lack of basic equipment in health facilities to support surgical services in most health facilities, especially in developing countries. Some of the issues related to equipment challenges in health facilities include lack of investment in modern equipment, equipment not working or not properly maintained, or lack of staff trained to maintain the highly found in Operating Rooms (Kahnand & Mentzer, 2010).

As the medical field goes through various technological developments some facilities have not been consistent with the changing technology to reduce delays and time wasting in surgical services. Successful strategy for improving surgical services efficiency means that a wide variety of surgical materials and equipment are needed (Overdyk & Fishman, 2011). In addition, Mazzei (2011) while evaluating ways of maximizing operating room utilization established that highly technical and specialized knowledge is required for the supply and maintenance of equipment and materials related to operating rooms if delays are going to be minimized.

A study by Gupta (2011) assessed the different perspectives of the Operating room (OR) staff with respect to the varied causative factors of operations delays of elective surgical cases. The study was meant to aid in the development of a practical model to decrease start time delays in ORs and facilitate on-time starts at Jai Prakash Narayan Apex Trauma Centre (JPNATC). The study established that the preparation of the equipment and required materials for the surgical cases needed to be done well in advance through the utilization of newer technology to enable timely booking and scheduling of cases.

In a comparison of 28 studies regarding medical mistakes, researchers found that 70% of errors are related to equipment unavailability surgical services, 44% are due to accessibility,

configuration and settings of equipment for surgical services, and 34% are related to direct malfunctioning of equipment during use. Between 12 and 18% of malpractice claims in the United States of America are made and approved based on equipment and technology failures (Schiff *et al*, 2009).

While equipment has been identified as a frequent cause of delays of elective surgical cases in public Hospitals globally, the problem is more in developing countries compared to developed countries. In Africa, 11% of delays of elective surgical cases in health facilities are due to broken equipment, some as simple as bar code scanners used for medication administration that did not scan because a buildup accumulated on the glass surface protecting the scanning device (Wysocki, 2014). As equipment become more critical in the delivery of health care services in Kenya , in another study by Spear (2009) that evaluated the measures on fixing health care from the inside to reduce delays identified the information technology (IT) department as responsible for delays as they did not repair the equipment in time.

1.5.4 Management Support Factors

Effective management of resources is crucial in the effective management of health facilities an all department in the facilities. Strum and Vargas (2012) on critical areas for focus in budgeting in a publicly funded health care system in Costa Rica, pointed out that the proportion of expenditure for surgical services is more relevant, because contemporary ORs require a major proportion of the hospital's budgetary allocation. Gallivan *et al* (2012) noticed that many published studies pertaining to OR management focus on costs, as there is an agreed position that ORs represent one of the most critical areas of a hospital for financial allocation.

For OR facilities to operate to the optimum, there is need to the facilities to be managed properly. Moorthy and Forrest (2013) on human factors analysis of crisis management skills among surgical trainees during a simulated crisis event in Kolkata stated that surgical nursing is considered a specialty and nurses need extra training and therefore the facility management needs to support the nurses through continued training not only on technical skills but also basic OR management skills.

Management developments of effective policies are very necessary for the operations of the OR and ensuring that quality services are delivered in the operating rooms. Perm (2016) in a study of Costs and Utilization of Operating Rooms in a Public Hospital in Trinidad, West Indies established that management policies that are concerned with OR should be made with clear understanding of necessary data from the section. The studies advised that in developing the management policies, the management should be guided by the data analysis and encourage data-driven insight into baseline measurement and opportunities for clinical and operational improvements that can affect real change for the Mission Hospital.

Developing policies that encourage continuous improvement in dealing with modern health challenges are issues of concern for modern health managers and practitioners. Guerriero and Guido (2011) advised that the only way to improve upon existing processes is always ensuring that effective operations through modern methods and technology are enhanced through favorable policies. Another Study by Scott and Rege (2011) evaluated the challenges of health care services in Africa where the study pointed out that good policies that encourage continuous improvement provide the or with a framework for reaching the next level of excellence. On the other hand management of health facilities across the world that have developed policies that encourage continuous improvement in operation services can to a large extent improve the quality of services in elective cases in their operating rooms facilities.

One of the policies that guide the operation OR, as stated by Guerriero and Guido (2011) should that one that emphasizes that in achieving OR efficiency, there is need to ensure that first-cases of elective surgery start on-time as planned. Dexter et al (2013) evaluated the management strategies to decrease variability in operating room utilization in South Africa health care system while applying linear statistical modeling and Monte Carlo simulation to operating room management emphasized that when the first surgical case of the day is delayed, the rest of the day is typically impacted with a series of late starts, as well. Among the chief reasons for the first and subsequent delays is poor management policies that affect the overall operations of the OR facility.

While Kenya has made many positive strides in strengthening health systems effectiveness, surgical services efficiency, reduction of delays in surgical operations, strict start and end time of cases is crucial in determining the effectiveness of the health services delivery in any given health facility (Galukande & Kaggwa,2013). The health facility management team needs to be able to identify the sources of operating room inefficiencies and challenges as this is important in designing strategies to prevent delays and ultimately improve the overall provision of surgical services (Linden *et al*, 2012).

1.5 Methodology

The study adopted a descriptive cross-sectional study design encompassing use of both quantitative and qualitative data. Quantitative data was collected through questionnaires administered to operating room staff while qualitative data was collected through Key Informant Interviews with operating room administrators. Stratified random sampling was applied to select 238 respondents from a target population of 494 operating room staff drawn from the three facilities based in Nairobi (1), Mombasa (2) and Kisumu (3). Two (2) Key informants from each targeted facility were purposively selected for inclusion in the study. Descriptive data was then analyzed using Statistical Package for Social Sciences version 23.0 and the results were presented through mean and Standard deviation. Inferential statistics were calculated using Pearson's Correlation and Multi-Linear regression methods to test the relationship between variables at 95% confidence interval where *p-values of* ≤ 0.05 were considered significant. Qualitative data was analyzed thematically and was guided by the study objectives, and then the results were triangulated with quantitative findings from questionnaires.

1.6 Study Findings

The findings of the study indicate that out of the 238 respondents targeted by the study, 213 of them, representing 89.5% participated in the study while only 25 (10.5%) did not respond. This indicates that the study was well participated in and therefore the results are representative.

1.6.1 Descriptive Analysis Summary

Table 4.1 Factors Influencing Delays of Elective Surgical Cases in Private health Facilities

Patient Factors	Health Facility (1) Nairobi		Health Facility (2), Kisumu		Health Facility (3), Mombasa	
	Mean	Standard Deviation	Mean	Standard Deviation	Mean	Standard Deviation
Patient factors contribute to delays in elective cases.	3.63	1.450	3.79	.802	3.40	.894
Staff factors contribute to delays of elective cases in private health facilities in Kenya	1.81	.893	2.79	1.122	2.63	1.326
Equipment failure contributes to delays of elective cases.	3.28	1.540	2.14	1.099	2.97	.964
Hospital management factors do contribute to delays of elective cases	3.05	.987	2.29	.914	2.60	1.070

The findings of the study indicate that patient factors contributed to delays in elective cases in all the three private health facilities in Kenya. This concurred with Shantanu *et al*, (2015) findings that established that patient factors contributed to delays of elective surgical cases where 10% of procedures at certain facilities were either cancelled or delayed due to improper and inadequate pre-operative preparation of the patients. The effect was more in Kisumu facility that registered a mean of 3.79 followed by the facility Nairobi with a mean of 3.63 while the patient factors contribute less to delays in elective cases in the Mombasa facility registered a mean of 3.40. There was a high difference in response for Nairobi facility with a standard deviation of 1.450 compared to both Mombasa and Kisumu facilities that registered a standard deviation of .894 and .802 respectively.

The findings also established that staff factors contributed to delays in the private health facilities in Kenya. The findings support results by Jonnalagadda and Hariharan (2012) who established that 89% of cancellations occurred in patients undergoing elective surgery and the leading reasons were staff related. The effect staff factors had on delays was more in Kisumu facility which registered a mean of 2.79, followed by Mombasa facility that registered a mean of 2.63. The effect was however low in Nairobi that registered a mean of 1.81. The difference in responses in this part was high in Kisumu and Mombasa facility that indicated a standard deviation of 1.326 and 1.122 respectively while the Nairobi facility registered the lowest standard deviation of 0.893.

On the effects of equipment factors, the findings indicated that equipment factors contributed to delays of elective surgical procedures in the three private health facilities in Kenya. These findings concur with Kahnand and Mentzer (2010) findings that highlighted operation delays caused by equipment challenges in health facilities, that included lack of investment in modern equipment, equipment not working or not properly maintained, and lack of staff trained to maintain the highly specialized equipment found in the operating rooms. The effects was highest in Nairobi facility registered a mean of 3.28, followed by Mombasa facility with a mean of 2.97 and lastly by Kisumu facility that registered a mean of 2.14. There was a high variation in responses with a standard deviation of 1.540 for Nairobi facility followed by the Kisumu facility with a standard deviation of 1.139. Reponses from the Mombasa facility registered an average variation in responses with a standard deviation of .964.

Lastly, the findings of the study indicated that hospital management factors contributed to delays of elective cases in the private health facilities in Kenya. The findings echo findings by Scott and Rege (2011) who pointed out that good policies that encourage continuous improvement provide ORs with a framework for reaching the next level of excellence The findings indicated that the effects was high in the Nairobi facility that registered a mean of 3.05, followed by Mombasa facility that registered a mean of 2.60 while the Kisumu facility registered a mean of 2.29. The response indicated an average standard deviation of 1.070 for Mombasa facility and an average variation in response of .987 for Nairobi facility and .914 Kisumu facility.

1.6.2 Inferential Statistical Analysis

Bivariate Linear Correlation Analysis

This part of the study contains the analysis to establish whether each of the independent variables: Patient factors (X1), Staff factors (X2), Equipment factors (X3) Management factors (X4) influence the dependent variable: Delays of elective surgical cases in three private health facilities in Kenya. The findings for each variable are given by Pearson (r). If its corresponding p-value is less than 0.05 at 95% confidence level, then the study concludes that there is a significant relationship between the variables

Table 4.2 Bivariate Correlation

		Y	X1	X2	X3	X4
Delays of elective surgical cases	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	213				
Patient Factors	Pearson Correlation	.216	1			
	Sig. (2-tailed)	.818				
	N	213	213			
Staff Factors	Pearson Correlation	.481**	.038	1		
	Sig. (2-tailed)	.008	.585			
	N	213	213	213		
Equipment Factors	Pearson Correlation	.432	.280**	.550**	1	
	Sig. (2-tailed)	.055	.000	.000		
	N	213	213	213	213	
Management Factors	Pearson Correlation	.541**	.082	.118	.139*	1
	Sig. (2-tailed)	.000	.234	.085	.043	
	N	213	213	213	213	213

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

The results indicate that out of four factors studied, staff and management factors (X_2 ; $\beta_2 = .481$, $P < .008$), (X_4 ; $\beta_4 = .541$, $P < .000$), had a significant influence on the delays of elective surgical cases in private health facilities in Kenya, while patient and equipment factors (X_1 ; $\beta_1 = .216$, $P > .818$), (X_3 ; $\beta_3 = .432$, $P > .055$) did not have any influence on delays of elective surgical cases in private health facilities in Kenya. This means improvement of staff and management factors would significantly contribute to reduced delays of elective surgical cases in private health facilities in Kenya while patient and equipment factors would not have any significant effect on delays of elective surgical cases and therefore the facilities need to put a lot of focus and effort on staff and management factors other than on patient and equipment factors.

Regression Analysis

The study used the following multi-linear regression model for the analysis.

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$$

Table 4.3 Factors influencing delays of elective surgical cases in private health facilities in Kenya: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.565 ^a	.367	.339	.44609

The coefficient of determinant (R-squared) of .367 that presents a 36.7% of the total variation in the delays of elective surgical cases in private health facility hospitals in Kenya can be explained by patient factors, staff factors, equipment factors and management factors in private health facility hospitals in Kenya. On the other hand, the Adjusted R Squared of .339 indicates that these variables (patient factors, staff factors, equipment factors and management factors) in exclusion of constant variable, explained the changes in the delays of elective surgical cases in the private health facilities in Kenya by 33.9%. The remaining (66.1%) can be explained by the factors not included in the regression model under investigation.

Table 4.4 Factors influencing delays of elective surgical cases in private health facility hospitals in Kenya: ANOVA

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.678	4	4.169	23.395	.000
	Residual	37.069	208	.178		
	Total	53.747	212			
a. Dependent Variable: Delay of elective surgical cases						
b. Predictors: (Constant), Management, Staff, Patient, Equipment						

The findings of the study show a regression output of patient factors, staff factors, equipment factors and management factors as valid ($F(4, 208) = 23.395, P < 0.000$). This means that the (patient factors, staff factors, equipment factors and management factors) can be used as predictors explaining the variation in the delays of elective surgical cases in the private health facilities in Kenya. The $P < 0.000$ which is less than the critical value of 0.05 leads us to reject the null hypothesis and to accept the alternative hypothesis that (patient factors, staff factors, staff factors and management factors) combined have a significant influence on the delays of elective surgical cases in private health facility hospitals in Kenya.

Table 4.5 Factors influencing delays of elective surgical cases in private health facility hospitals in Kenya: Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.011	.212		18.963	.000
	Patient Factors	.034	.031	.068	1.114	.267
	Staff Factors	.074	.046	.113	1.617	.007
	Equipment Factors	.009	.045	.015	.201	.841
	Management Factors	.516	.057	.531	9.101	.000

The results shows a regression results that indicate that out of the four the factors studied (patient factors, staff factors, equipment factors and management factors) only Staff and Management factors ($X_2: \beta_2 = .074, P < .007$), ($X_4: \beta_4 = .516, P < .000$), had a significant influence on the delays of elective surgical cases in the private health facilities in Kenya, while patient and equipment factors ($X_1: \beta_1 = .034, P > .267$), ($X_3: \beta_3 = .009, P > .841$) did not have a significant influence on delays of elective surgical cases in the private health facilities in Kenya. This means that improvement of staff and management factors would significantly contribute to reduced delays of elective surgical cases private health facilities in Kenya. The other two factors (patient factors and equipment factors), although were important, they would not significantly contribute to reduction of delays of elective surgical cases at the private health facilities in Kenya.

$$Y = 4.011 + .034X_1 + 0.074X_2 + 0.009X_3 + 0.516X_4 + e$$

This indicates that a unit increase of .034 in Patient Factors, of .074 in Staff factors, of .009 in Equipment Factors and of .516 in Management factors would influence a unit change in the delays of elective surgical cases in private health facilities in Kenya if all the other factors remained constant at 4.011.

Results from qualitative data (Key interviews) also indicated that in all the three facilities covered by the study there was agreement that patients' factors, staff factors, equipment factors and management factors contributed to delays of elective surgical cases in the three private health facilities in Kenya.

1.7 Triangulation of Results

While results from qualitative data (Key interviews) indicated that in all the three facilities covered by the study there was agreement that patients' factors, staff factors, equipment factors and management factors contributed to delays of elective surgical cases in private health facilities in Kenya, the findings from quantitative (questionnaires) indicated that in all the three facilities only staff factors and management factors contributed to delays of elective surgical cases in private health facilities in Kenya. The finding from the analysis of the quantitative data (responses from questionnaires) unlike responses from qualitative data (Key Interviews) found out that although patient factors and equipment factors were important, they did not significantly contribute to delays of elective surgical cases in private health facilities in Kenya.

1.8 Conclusion

The results from qualitative data (Key interviews) indicated that in all the three facilities, there was agreement that patients' factors, staff factors, equipment factors and management factors contributed to delays of elective surgical cases in the three private health facilities in Kenya. The findings from quantitative data (questionnaires) indicated that in all the three facilities only staff factors and management factors significantly contributed to delays of elective surgical cases in the three private health facilities in Kenya while patient factors and equipment factors, though were important, did not significantly contribute to delays of elective surgical cases in the private health facilities in Kenya.

1.9 Recommendations

There is need for each of private health facility in Nairobi, Kisumu and Mombasa covered by the study to address the individual facility staff factors that contribute to delays of elective surgical procedures in order to reduce delays of elective surgical procedures. There is also need for the individual health facility to resolve the patient factors specific to the health facility that contribute to delays of elective surgical procedures at the health facility.

Each health facility to work on the identified equipment factors specific to the facility that contribute to delays of elective surgical cases and ensure that these factors are properly addressed to reduce delays of elective cases. Finally, each facility needs to address its own management challenges that contribute to delays of elective surgical in order to reduce such delays.

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