Analysis Of Six Sigma Principles On Hospitals Market Share Performance, Of Private Hospitals In Nairobi County, Kenya.

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Abstract

Worldwide, Healthcare Is Facing Serious Quality Problems While Costs Are Exploding. Care Processes Are Poorly Designed And Characterized By Unnecessary Duplication Of Services, Long Waiting Times And Delays. Costs Are Exploding, And Waste Is Identified As An Important Contributor To The Increase In Healthcare Expenditures. The Private Sector Owns 52% Of The Kenyan Healthcare Industry. Kenya Is Committed To Achieving Universal Health Coverage By 2030. The Country's Focus On Achieving This Goal Experiences The Effect Of The 2010 Constitutional Amendment, Which Brought About The Devolution Of The Healthcare Sector. This Condition Shows That The Private Sector Faces More Competition Because The Public Sector Has More Room To Improve Its Performance Through Efforts From The 47 County Governments. Thus, It Needs A Six-Sigma Approach To Maintain A Significant Market Performance. The Primary Objectives Of This Study Focus On Utilizing The Six Sigma Approach To Investigate The Influence Of Services' Quality, Consistency, Speed, And Accuracy On The Market Performance Of Private Hospitals In Nairobi. The Four Objectives For This Study Are To Determine The Effect Of Quality Of Services On Market Performance Of Private Hospitals In Nairobi; To Establish Whether Consistency Affects Market Performance Of Private Hospitals In Nairobi; To Investigate How Speed Of Carrying Out Procedures Affects Market Performance Of Private Hospitals In Nairobi And; To Analyze The Effect Of Accuracy Of Procedures On Market Performance Of Private Hospitals In Nairobi. The Procedures And Processes Guiding This Study Are Primarily Dependent On The Six Sigma Theory. Other Theoretical Perspectives That Guide The Study Include The Three-Factor Theory, Expectancy Theory, Social Learning Theory, And Structural Contingency Theory. The Five Theories Help The Study To Evaluate The Influence Of Services' Quality, Consistency, Speed, And Accuracy On The Market Performance Of Private Hospitals In Nairobi. This Study Employed The Triangulation Method. The Triangulation Approach Calls For A Mixture Of Study Methodologies, Theories, Investigators, And Datasets. The Target Population Of This Study Was The Private Healthcare Providers And The General Public Members Within Nairobi County, Kenya. The Study Used Structured Questionnaires To Collect Primary Data. The Analysis Of Qualitative Data Depended On A Descriptive Statistical Approach – Spss's Frequency Counts. On The Other Hand, Thematic Analysis Tools Helped In Analyzing Qualitative Data. Finally, Inferential Statistics Evaluated The Underlying Relationship Between The Dependent And Independent Variables. This Study Targets The Private Hospitals Within Nairobi County, Kenya. It Targeted 83 Private Hospitals With The Best Reviews And The Largest In Size. However, The Response Rate Was 96.4 – 80 Hospitals. Results Show That Most Private Hospitals Within Nairobi County Implement The Six Sigma Theory Because They Prioritize Quality, Consistency, Speed, And Accuracy Of Service In Most Of Their Operations. However, Health Care Processes Are Poorly Designed And Characterized By Unnecessary Duplication Of Services, Long Waiting Times, And Delays. This Condition Prevails Because The Market Performance Of Private Hospitals In Nairobi County Is Subject To Various Unfavorable External Factors.

I.   INTRODUCTION

Introduction

      This chapter will cover background to the study, statement of the problem, purpose of the study, objectives of the study, research questions, significance of the study, scope of the study, limitation of the study, delimitation of the study, assumptions of the study, and operational definitions of term.

Background of the Study

      Six Sigma principles are a set of strategies and tools used to improve operational performance by reducing variation and eliminating defects. They can be used to help healthcare organizations improve patient care, reduce costs, and increase efficiency.

By using Six Sigma principles, healthcare organizations can reduce the amount of time spent on redundant tasks, reduce medical errors, and improve the quality of patient care. Additionally, Six Sigma principles can help healthcare organizations identify potential problems and opportunities for improvement. This can help them prioritize resources, allocate resources more effectively, and develop more effective processes.

Additionally, Six Sigma principles can help healthcare organizations improve their customer service. By measuring customer satisfaction and feedback, healthcare organizations can identify areas for improvement and create more effective customer service processes. By improving customer service, healthcare organizations can increase patient loyalty and create a more positive patient experience

Global healthcare systems are facing serious quality problems while costs are exploding. The Institute of Medicine produced two reports demonstrating healthcare has serious safety and quality problems and is in need of fundamental change (Wakefield et al., 2021). Care processes are poorly designed and characterized by unnecessary duplication of services, long waiting times and delays. Costs are exploding, and waste is identified as an important contributor to the increase in healthcare expenditures. As a result, healthcare consistently does not succeed in meeting patients' needs. The prevalence of this situation results from healthcare systems' ineffectiveness in employing the Six Sigma principles to guide their performance.

All over the world, healthcare is facing serious quality problems while costs are exploding. The Institute of Medicine (IOM) produced two reports demonstrating healthcare has serious safety and quality problems and is in need of fundamental change (Wakefield et al., 2021). Care processes are poorly designed and characterized by unnecessary duplication of services, long waiting times and delays. Costs are exploding, and waste is identified as an important contributor to the increase in healthcare expenditures. As a result, healthcare consistently does not succeed in meeting patients' needs.

Private hospitals and other institutions associated with private healthcare have a significant market share in Africa. For instance, recent reports show the private sector makes up 50% of the healthcare industry in Sub-Saharan Africa (Mohamoud & Mash, 2020). However, the annual growth rate of this sector continues to decrease over time. According to Mohamoud and Mash (2020), this decline has a significant correlation with quality management practices within the private sector of the modern healthcare industry. Such a correlation shows that effective quality management could be one of the primary healthcare concerns in the region.

Healthcare resources, doctor-patient relationships, and access and cost of care are significant determinants of the private sector's market trends because they are directly related to patient satisfaction. For instance, research conducted within the East African population shows that patient satisfaction is significantly dependent on multiple factors, including cleanliness, empathy, communication, staff attitudes, medical equipment, and adequacy of medical supplies. Additionally, such studies also show that patients can show high satisfaction levels regardless of the prevalence of such inadequacies as lack of medication, equipment, essential resources, and shortages of personnel.

The Kenyan healthcare system depends on three primary categories of service providers. The three categories include public sector services, private for-profit entities, and not-for-profit private organizations. The not-for-profit organizations include mission hospitals, religious groups, and other non-governmental organizations. The market share percentage for the three categories are 48%, 38%, and 14%, respectively (Nyawira et al., 2021). This information shows that the private sector owns 52% of the local healthcare industry. Consequently, evaluating the quality of services associated with private healthcare providers is an essential thing within the country.

On the other hand, Kenya is committed to achieving universal health coverage by 2030. As a result, the country has set four primary objectives that will inform its plan and focus on this goal. The four objectives include strengthening access to healthcare services, enhancing the quality of healthcare services, promoting the responsiveness of the healthcare system, and protecting households and individuals from the financial risks associated with ill health (Nyawira et al., 2021). The country's focus on achieving these objectives and the ultimate goal experiences the effect of the 2010 constitutional amendment, which brought about the devolution of the healthcare sector. This condition shows that the private sector faces more competition because the public sector has more room to improve its performance through efforts from the 47 county governments. Thus, it needs a six-sigma approach to maintain a significant market performance.

An ideal situation exits where the healthcare providers in the private sector achieve their clients' satisfaction. This satisfaction results from the reliability of quality, consistency, speed, and accuracy of the healthcare services. Such services prevail when basic factors like healthcare resources, doctor-patient relationships, and access and cost of care are responsive to the clients' healthcare demands.

Private hospitals in Nairobi County

Private hospitals in Nairobi County are an integral part of the health care delivery system, as the public health sector is facing a lot of challenges due to the increasing demand. However, private hospitals in Nairobi County are facing a number of operational challenges, such as inadequate resources, high operational costs,

inadequate patient services, and inconsistent quality of care. For instance, recent reports show that that private hospitals account for less than a fifth (20%) of all health facilities in the country, but only contribute a quarter of all hospital bed capacity (MoH, 2022). Additionally, the percentage of outpatient visits to private hospitals is only 10%, and the percentage of inpatient visits is only 8% (MoH, 2022). As such, it is becoming increasingly important for private health care providers in Nairobi County to apply Six Sigma principles to enhance their market share performance and patient services. Such an approach can address the challenges because Six Sigma is a data-driven, process-focused management system that aims to improve quality, efficiency and productivity in any organization. It also involves defining customer requirements, measuring performance, analyzing data, and implementing solutions to improve processes and tasks.

Statement of the Problem

According to the Kenya Health Sector Strategic Plan 2018-2022, private hospitals have experienced unsatisfactory market performance. This is evidenced by the fact that private hospitals account for only 17% of all health facilities in the country, but only contribute 25% of all hospital bed capacity (Ministry of Health, 2018). Additionally, the percentage of outpatient visits to private hospitals is only 10%, and the percentage of inpatient visits is only 8% (Ministry of Health, 2018). This indicates that private hospitals are not seeing the same level of activity as public hospitals. Furthermore, private hospitals are only receiving 5% of the total public health expenditure, suggesting that they are not being fully supported by the government (Ministry of Health, 2018). These statistics clearly demonstrate the unsatisfactory market performance of private hospitals in Kenya.

The unreliability of quality, consistency, speed, and accuracy of healthcare services is a major gap in contemporary healthcare systems. Quality in African health care systems has become a major concern due to seemingly intractable poor health indices in most countries. For instance, the Kenyan healthcare system has been plagued by issues of low-quality and counterfeit medication, most hospitals being understaffed, leading to delays in treatment, hospitals employing unqualified and underqualified personnel leading to numerous medication and surgical errors and many unnecessary steps in the supply chain leading stock-outs in most hospitals. The importance of health care in the lives of people makes quality critical regardless of where services are provided in the hospital or community. The quality of services has largely received little attention in many African countries, yet, improving the quality of health services is vital to improving the abysmal level of health in Africa. That is why the purpose of this study is to address this gap by analyzing the effect of six sigma implementation on market performance of private hospitals in Nairobi.

Purpose of the Study

The purpose of this study is to analyze the effect of six sigma implementation on market performance of private hospitals in Nairobi.

Objectives of the study

The study was guided by the following specific objectives:
  i.   To determine the effect of quality of services on market share performance of private hospitals in Nairobi.
 ii.   To establish whether consistency affects market share performance of private hospitals in Nairobi.
iii.   To investigate how speed of carrying out procedures affects market share performance of private hospitals in Nairobi.
 iv.   To analyze the effect of accuracy of procedures on market share performance of private hospitals in Nairobi.

Research Questions

The study sought for answers from the following research questions:
 a)   What effect does quality of services have on market share performance of private hospitals in Nairobi?
 b)   How does consistency of services affect market share performance of private hospitals in Nairobi?
 c)   To what extent does speed of carrying out procedures affect market share performance of private hospitals in Nairobi?
 d)   What effect does accuracy of procedures have on market share performance of private hospitals in Nairobi?

Significance of the Study

The study will greatly help the private hospitals' management, and to some extent government to make six sigma a reality in the day-to-day running of hospitals, healthcare institutions and healthcare programmes like universal health coverage (UHC). The healthcare sector needs to be matched with this doctrine because of the nature of zero tolerance for mistakes and potential for reducing medical errors involved in healthcare as well as the need to reduce waste associated with lack of it. Six sigma is an effective tool that can help healthcare

organizations rely on valid data that may help prevent managers from using personal judgment to make decisions. Thus, six sigma implementation in healthcare management will reduce incorrect diagnosis, lab results and procedures. It will, therefore, reduce the cost incurred based on false guidance while ensuring accurate decision-making and most importantly this will lead to customer/patient satisfaction.

Scope of the Study

The study focused on six sigma principles and market share performance of private hospitals. More specifically, the study focused on quality of services, consistency of procedures, speed of procedures and accuracy of procedures all with regards to their effect on the market share performance of private hospitals in Nairobi, Kenya. The study was carried out among private hospitals in Nairobi, Kenya. The private hospitals in Nairobi were selected and used in this study in order to trigger their respective managers to fully implement the six sigma principles in their hospitals and healthcare institutions as this leads to improved patient care and an increase in market performance which finally translates to increased profitability. The study was anchored on six sigma principles, covering the period between 2019 and 2022. This period is selected because it is the most current, hence data may be easily available especially in connection to market performance of private hospitals in Nairobi. The study involved the corporate and functional level managers of the 83 private hospitals, whereby only one individual was considered from each institution. The corporate management members included procurement managers, finance managers, operations managers, or any other equivalent of the management team members from the hospitals.

Data management procedures during and after research

The following are the data management procedures that were necessary and effective during and after the research:
1. Data collection procedures: The study used structured questionnaires to collect primary data from private healthcare providers and the general public members within Nairobi County. To ensure the quality of data, the questionnaires were pretested, and the data collected was validated for accuracy and completeness.
2. Data organization and storage: The data collected was organized and stored in a secure and accessible location. The data was stored in an electronic format using password-protected files to ensure confidentiality and privacy.
3. Data backup and recovery: To minimize the risk of data loss, the data was backed up regularly to an external hard drive or cloud storage. The backup data was stored in a separate location from the original data to ensure that there is no loss of data in case of a disaster.
4. Data analysis: The analysis of qualitative data depended on thematic analysis tools, while quantitative data was analyzed using descriptive statistical approach in SPSS. The results of the analysis was documented and stored for future reference.
5. Data reporting: The findings of the study were presented in a report format. The report was well-organized and easy to understand, with clear and concise explanations of the results.
6. Data sharing and dissemination: The data collected during the study was made available to other researchers upon request. The data was shared in a secure and confidential manner to protect the privacy and confidentiality of the participants.
7. Data retention and archiving: The data collected during the study will be retained for at least 5 years after the completion of the research. This retention will enable the researchers to access the data for further analysis and follow-up studies.

Limitations of the Study

During data collection, the Covid-19 pandemic was still a crisis making it hard to access the respondents and gather information. Covid-19 posed a big challenge given the majority of the respondents had developed fear of coming into physical contact with the questionnaire on account that they might be infected with the virus. Additionally, the respondents were busy with their daily duties at the place of work during data collection. This made it hard to collect data on a single occasion. It also affected the ultimate response rate of the study. The other limitation encountered in the study was possible fear from respondents that the information may be used to intimidate them.

To overcome these limitations, I employed various strategies. Firstly, I used digital methods to gather data, such as online surveys, interviews, and focus groups that can be conducted remotely. This allowed me to collect data without having to come into physical contact with the respondents. Secondly, I employed a staggered approach to data collection, which involved collecting data over a long period of time and in multiple sessions, to allow for flexibility and accommodate the respondents' daily duties. Thirdly, I ensured that respondents are made aware of the purpose of the study, and that the data will be used for research and not for any other purpose. Finally, I employed rigorous data protection protocols to ensure that all data collected is kept confidential and secure.

Delimitations of the Study

This study was limited to private healthcare providers and the general public members within Nairobi County, Kenya. It covered all major locations within the county, including Roysambu, Kasarani, Ruaraka, Embakasi South, Embakasi North, Embakasi Central, Embakasi East, Embakasi West, Makadara, Kamukunji, Starehe, Mathare, Westlands, Dagoretti North, Dagoretti South, Langata, and Kibra. On the other hand, the time frame for this study was from 1st August, 2020 to 30th November, 2022 – 16 weeks. However, the first seven weeks were meant for writing the proposal, designing the data collection tools, and defending the proposal.

Assumptions of the Study

The study assumed that respondents shared relevant and accurate information with regard to implementation of six sigma principles and the market performance of private hospitals. The study assumed that respondents of the study had worked or consumed services in the respective private hospitals for a significant period of time so as to understand whether six sigma principles have been fully actualized and how this has influenced the customer loyalty and satisfaction and their overall effect on the market performance of these hospitals in particular.

Operational Definition of Terms

This section gives the meaning of various terms as used in this study. Therefore, they are not limited to the specific meanings characterizing them in this study.

Private sector: It refers to a part of an economy that is under the control and management of companies and individuals, but not the government.

Lean Six Sigma: It is a data-driven procedure that focuses on optimizing, improving, and stabilizing the business processes or other activities associated with a given organization.

Patient satisfaction: It defines the extent to which patients are happy, pleased, or contented with the healthcare services they receive both inside and outside their providers' premises.

Healthcare quality: It is the degree or extent to which healthcare services increase the probability of outcomes that individuals and populations desire to achieve.

Primary care: It is the healthcare that practitioners and their teams provide to address personal healthcare needs and develop sustainable partnerships with clients. Such services are often accessible and integrated, and they are also practised in community and family contexts.

Service delivery: It refers to a framework through which services reach the clients or customers from the provider.

Healthcare equipment: It refers to devices that healthcare providers use for therapeutic, diagnostic, and monitoring of the care or services during treatment processes.

Service efficiency: It is the ability of services to fulfil clients' goals with minimal effort from both the service providers and receivers.

Diagnosis: It refers to the process that healthcare providers use to identify the type of sickness or other unhealthy conditions by through the examination of the relative signs and symptoms.

Quality management: It defines the act or process of overseeing the tasks and activities that are essential for achieving or maintaining the desired excellence level.

Organizational performance: It is the process of analyzing the performance of an organization or any entity against its goals and objectives.

Conceptual framework: It is a model that shows the expected relationship between the dependent and independent variables of the study. It also defines the research objectives.

Speed of service: It refers to a metric that measures the time it takes the service providers to complete a specific action.

Six Sigma: It refers to a structured methodology that entities can use to minimize variations within their production processes by ensuring effective and systematic identification and elimination of defects.

Accuracy of service: It is the extent to which the results of medical and other treatment measures conform to the right standards.

Market performance: It refers to a measure of how well a particular stock, index, mutual fund, or other type of investment has performed over a certain period of time.

II.   LITERATURE REVIEW

Introduction

The primary focus of this chapter is to review literature about the Six Sigma principles and quality, consistency, speed, and accuracy of health care services in relation to hospitals' market share performance within the private sector. The review will address these factors by covering three primary categories – empirical literature review, relative theoretical frameworks, and conceptual framework for the study. Eventually, the chapter includes

a recap of the literature review in all its sub-sections. It creates a more solid basis for understanding the underlying correlations between the study's dependent and independent variables.

Theoretical Framework

This study reviews five theoretical frameworks to guide its analysis of the influence of services' quality, consistency, speed, and accuracy on the market share performance of private hospitals in Nairobi. The procedures and processes guiding this research are primarily dependent on the Six Sigma theory. Other theoretical perspectives that were included in this review include the Three-factor theory, Expectancy theory, Social learning theory, and Structural contingency theory.

Six Sigma theory

The six-sigma theory originated from an operational model that a Motorola engineer developed in 1984 to facilitate its performance. It refers to a structured methodology that entities can use to minimize variations within their production processes by ensuring effective and systematic identification and elimination of defects. In statistical terms, the Greek letter Sigma refers to a standard deviation of a particular measurement or statistic from the mean value. This deviation denotes the presence of a defect in the measurement.

However, research shows that it is hardly possible to achieve zero defects in a particular operational process. This condition led to the adoption of the six sigma theory because it can only allow for 3.4 defects per every million opportunities. Consequently, the proponents of this theoretical framework claim that its application can achieve 50% of cycle-time reduction, process cost reduction, and less material wastage (Mohamoud & Mash, 2020). They also claim that this framework can facilitate a better understanding of customer demands, a higher value stream, and increased customer satisfaction.

Three-Factor theory

David Sirota developed the three-factor theory to discuss the factors that are basic to human motivation. According to Sirota's arguments in the three-factor theory, there are three primary factors that help entities build enthusiasm within their teams. The three factors include fairness, achievement, and camaraderie. He posited that the three factors should work in togetherness to achieve the most appealing results in building enthusiasm within teams. The three terms are basic in operational teams because every team member likes to be treated fairly and to make some achievements over time. Additionally, every team member enjoys having a positive relationship with other team members.

Research shows that it is significantly challenging for businesses to put place the three factors in place at the same time. This challenge cuts across businesses in all industries and sectors in modern society. Albayrak (2019) states that health care providers in the private sector can hardly maximize their profitability without effective management of their diverse teams. They have to consider all their unique goals, visions, and motivations for the future. This argument holds because factors or behaviours that may be appealing to one person may be unappealing to another.

Expectancy theory

The expectancy theory is also known as the expectancy theory of motivation. Victor H. Vroom developed this theory in 1964 following his study on the motivations that characterize decision-making processes. Vroom developed this theory to explain the reasons why people choose one decision over the other in their daily operations. According to Vroom, these decisions are dependent on three primary factors. The three factors include expectancy, valence, and instrumentality.

This theory is significantly applicable in the business sector because business managers can maximize their businesses' performances by correlating the preferred outcomes and the aimed performance levels. According to Part and Perera (2022), it is the responsibility of managers and business owners to ensure that their workers achieve the aimed performance milestones because such conditions motivate them to put more effort into production activities. In the long run, their motivation at individual levels facilitates performance at organizational levels.

Social learning theory

Albert Bandura proposed the social learning theory to illustrate the importance of modelling, observing, and imitating the attitudes, behaviours, and emotional reactions of other people in every social setup. According to Albert Bandura, cognitive and environmental factors around a particular person engage in constant interactions to influence his behaviour and learning. This theory parallels the above theoretical frameworks because it holds that mediating processes associated with different individuals occur between stimuli and responses. Additionally, the theory holds that people and groups learn behaviour from environments following a process called observation

learning. Although most people relate this theoretical framework to early childhood learning and behaviours, this study borrows from it the concept of motivational impacts on a person's performance.

Structural contingency theory

The structural contingency theory holds that 'there is "no one best way," meaning that no single structure or structural type is optimal for all organizations. Instead, the structure that is most effective is the structure that fits certain factors, called contingencies.' According to Donaldson (2015), this theory confirms that "the effect on organizational performance of organizational structure depends upon how far the structure fits the contingencies, such as uncertainty, strategy, and size." The word contingency, as used in this section, defines the status of having a particular backup plan to ensure a continuous operational status of the primary business activities.

This theory suggests that business organizations should have specific plans that can guide organizational changes in necessary cases. Research shows that structural contingency plans and decisions are subject to various internal and external influences. The internal influences include the factors that take place within the walls of a particular organization. Some of such factors include the organizational size and job tasks characterizing each worker. On the other hand, external influences include the factors that occur outside the organization but affect its operations (Penix et al., 2019).

Relationship among theories

The relationship among the above theories lies in their potential contributions to understanding the factors influencing market share performance and organizational effectiveness in the context of private hospitals. Firstly, the Six Sigma theory provides a systematic approach to process improvement and quality management, enhancing operational efficiency and customer satisfaction, thus potentially impacting market share. Secondly, the Three-factor theory emphasizes the role of job satisfaction, organizational commitment, and professional identification in individual performance and organizational outcomes, including market share. Expectancy theory adds to this milestone by focusing on the relationship between individuals' beliefs, efforts, and performance, highlighting how employees' expectations and motivations can influence their contributions to market share performance.

On the other hand, the Social learning theory recognizes the importance of observation, imitation, and social reinforcement in shaping behaviors and skills. As such, it can be relevant to understanding knowledge transfer and the adoption of Six Sigma practices within hospitals. Finally, the Structural contingency theory acknowledges that organizational structure and design should align with the external environment and internal contingencies, which can impact the effectiveness and performance of private hospitals, potentially influencing market share. Hence, incorporating these theories helps the project provide a comprehensive understanding of the factors affecting market share performance in private hospitals and the potential role of Six Sigma principles within this context.
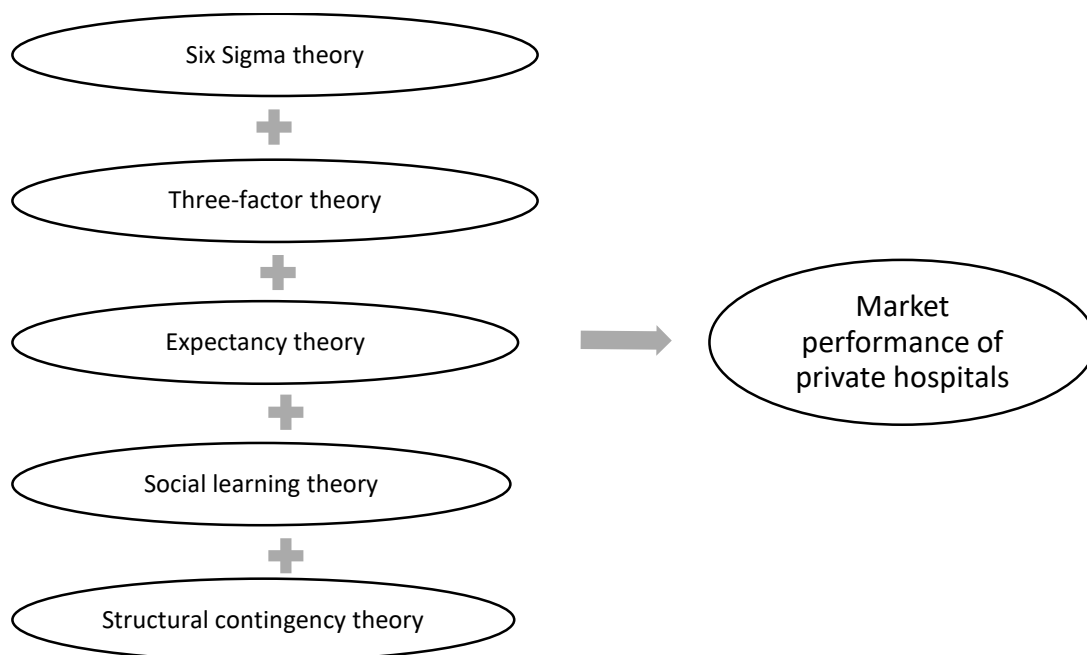

Figure 1: Theoretical framework
Source: Researcher (2022)

Empirical Literature
Lean Six Sigma principles
        Lean originated from the Toyota Production System and refers to a process improvement criterion that improves performance efficiency by reducing waste. According to the term's origin, waste refers to any step or procedure that adds no value to the end products and services. On the other hand, six Sigma originated from an operational model that a Motorola engineer developed in 1984 to facilitate its performance. It refers to a structured methodology that entities can use to minimize variations within their production processes by ensuring effective and systematic identification and elimination of defects. Although the two approaches have different origins, research shows that they have overlapping scopes (Kobo-Greenhut et al., 2021). As a consequence, modern society uses the overlap to combine them in a Lean Six Sigma approach.

        Boehler (2021) states that "Lean Six Sigma is a performance improvement methodology that incorporates effectiveness to reduce variation in an existing process." Lean six sigma (LSS) principles help various industries improve their operational efficiency by reducing defects and eliminating waste. Correct application of these principles can lead to happier outcomes both for clients and business owners. According to Boehler (2021), the lean six sigma principles play critical roles in the health care industry because they help the practitioners minimize defects that can lead to medical errors during practice. For instance, studies show that using the six sigma approach helps hospitals and individual practitioners shorten wait times, reduce treatment errors, increase lab results' turnaround time, and prevent injuries and falls within health care centres.

        According to Juliani and De Oliveira (2019), the lean six sigma principles are the five key elements that individuals or entities should keep in mind to ensure the success of their daily processes or studies. The first of the five principles states that entities should focus on their customers or clients. The fundamental goal of any change or study for private healthcare providers should be about delivering maximum benefits to their clients – patients. Research shows that the best way to uphold this principle is through the establishment of quality standards that follow the prevailing demands from customers.

        The second principle is about finding the problem and focusing on solving it. According to Juliani and De Oliveira (2019), the lean six sigma approach applies this principle because implementing changes or starting any new study can cause entities to forget about their initial problems as a result of the confusion related to newly desired achievements. Private healthcare centres also can lose their performance effectiveness by adopting new operational models or chasing new goals. Juliani and De Oliveira (2019) show that they can avoid such a challenge by gathering sufficient data about their specific problems. Consequently, they should apply this data to refine the areas suffering from these problems.

        The third principle is about removing variations and bottlenecks. Studies show that entities can fail in their application of the LSS process because of failure to remove the relative bottlenecks and variations. After the problem identification stage, entities should look for the most reliable ways of decreasing the chances of defects. However, this achievement is a significant challenge for most firms in the healthcare and other industries because defects may arise from long, intricate procedures that create room for waste and mistakes over time. Thus, finding a way of removing or streamlining these procedures is a reliable way of achieving efficiency and quality control.

        The fourth principle is about communicating clearly and training the team members. The LSS fundamentals call upon all the parties associated with a particular practice to understand its goals and know its progress by attaining the necessary skills and facilitating effective communication. This principle is significantly helpful in the private sector of the modern healthcare industry because health literacy is a fundamental need for both the clients and healthcare practitioners. According to Liu et al. (2020), health literacy refers to the extent to which individuals have the ability to obtain, process, and understand elemental health information and services that can help them make excellent health decisions. Another research also suggests that there exists a direct correlation between health literacy and health outcomes.

        Finally, the fifth principle is about flexibility and responsiveness. Liu et al. (2020) state that flexibility and responsiveness of processes associated with any practice are necessary because LSS and change go hand-in-hand. On the other end, a significant body of research shows that the healthcare industry depends on LSS processes and tools to facilitate its effectiveness in the design, assessment, and implementation of quality improvement activities. The two publications parallel this principle because they confirm that private health care providers must refine or remove inefficient and faulty processes to maximize their operational performance. Additionally, studies show that clinging to a failing approach is one of the primary sources of ineffectiveness in any practice. Such an operational ideology is not an option when an entity is following the LSS approach.

The DMAIC method
        The DMAIC method refers to a five-stage process that informs the application of the LSS methodologies. The abbreviation represents the five stages of this process – define, measure, analyze, improve, and control (Purdue University, 2021). This process is essential to health care practices because the above literature reviews indicate that hospitals and individual practitioners rely on the LSS processes and tools to facilitate its effectiveness

in the design, assessment, and implementation of quality improvement activities. The following five paragraphs review past literature to show the significance of the DMAIC method in improving the check-in processes and other relative activities within the health care industry. The review addresses the specific stages of the method.

The first stage of the DMAIC process is to define the problems facing a particular process. Defining the problem helps the team manage a particular process to set achievable and appropriate goals for their operations. Some of such goals may incorporate shorter waiting times and improved data management approaches within check-in processes. According to Purdue University (2021), the creation of process maps is one of the most reliable ways of defining a problem and setting relative goals. A process map is necessary because it includes all the details associated with specific steps in a particular process. In case of a check-in process, the specific steps include updating records, collecting co-pays, and reviewing insurance information.

Measuring is the second stage of the DMAIC process. Studies show that it is necessary to measure the performance of the current process after defining the problem and setting the relative goals because it helps the management to remove variations and bottlenecks. This stage occurs at every aspect or step of a particular system or process because this approach is the most reliable way of identifying the prevailing variations (Juliani & De Oliveira, 2019). The results that the management teams or other relative authorities obtain from this stage should guide them to identify the bottlenecks by noting the areas where the systems slow down.

The third stage of this method is the analysis of the results obtained from the second stage. According to Penix et al. (2019), the teams in charge of particular processes should evaluate the data they get from specific steps of the processes. When addressing this stage, these teams should focus on identifying the elements or factors that require streamlining or elimination. Additionally, they should ensure that this stage helps them identify the root causes of the bottlenecks that they discovered in the previous stage. For example, this phase can help them identify the correlations between different variables by using percentages and probabilities.

The fourth stage is to improve the systems. Research shows that the fundamental purpose of using the DMAIC method with the LSS methodologies is to improve the performance of existing processes. As a result, entities should have the capacity to improve the performance of their processes after completing the analysis of the underlying problems. Research shows that this stage should incorporate two primary activities – developing and testing solutions (Lam et al., 2010).

Finally, the DMAIC method shows that the processes dependent on the LSS methodologies should conclude their cycles by controlling the features that arise from the previous phase – improvement. For instance, the parties in charge should ensure frequent monitoring and documentation of every improvement to ensure that the new procedures stay on course. According to Penix et al. (2019), control charts are the best tools that entities can use to determine the reliability and effectiveness of the new procedures over time.

Private hospitals' market share performance

Market performance refers to the measure of how well a particular stock, index, mutual fund, or other type of investment has performed over a certain period of time. According to Albayrak (2019), analysts use sales volumes and other sales values to calculate this parameter. Consequently, the market share performance of private hospitals in Nairobi refers to the trend of the health care services and commodities that results from the private sector within Nairobi. Albayrak (2019) shows that this parameter is significantly important because it helps entities conceive reliable ideas about how powerful, large, or important their businesses are within a particular sector. This factor is subject to various other factors affecting the market. For instance, research shows that the market performance of private health care providers is significantly dependent on the quality, consistency, speed, and accuracy of the medical services.

Private hospitals and other institutions associated with private healthcare have a significant market share in Africa. For instance, recent reports show the private sector makes up 50% of the healthcare industry in Sub-Saharan Africa (Mohamoud & Mash, 2020). However, the annual growth rate of this sector continues to decrease over time. According to Mohamoud and Mash (2020), this decline has a significant correlation with quality management practices within the private sector of the modern healthcare industry. On the other hand, the Kenyan healthcare system depends on three primary categories of service providers. The three categories include public sector services, private for-profit entities, and not-for-profit private organizations. The not-for-profit organizations include mission hospitals, religious groups, and other non-governmental organizations. The market share percentage for the three categories are 48%, 38%, and 14%, respectively (Nyawira et al., 2021). Thus, the private sector owns 52% of the local healthcare industry.

Quality of services and hospitals' market share performance

According to Mohamoud and Mash (2020), service quality refers to an external attribute of customers' perceptions that is significantly dependent on their encounters and experiences in getting a particular service. Research shows that the quality of a particular service does not depend on the final outputs only because people see it throughout the relative production processes. Another research shows that people should only estimate the

quality of the health care services from the client's point of view. This argument holds because the clients or receivers of the health care services may have views that differ from the ones of the practitioners. Thus, Mohamoud and Mash (2020) concluded that the quality of health care services depends on the satisfaction they give to clients.

Service quality in the health care industry is directly correlated to market performance because the resultant increase in satisfaction leads to a rise in customer loyalty levels. This argument parallels the above paragraph because the studies guiding the two discussions assert that high-quality treatment services win high satisfaction from customers. Mohamoud and Mash (2020) identify an active correlation between the quality of services and market performance because customer loyalty is a subject of customer satisfaction. Secondly, sales volume and market performance are subjects of customer loyalty. Another research shows that an increase in customer loyalty can help private firms make more profits through an increase in their sales volumes. In the long run, they use these profits to facilitate growth in their market performances.

Consistency of services and hospitals' market share performance
Service consistency refers to achieving sameness, fairness, and uniformity in the execution or delivery of all the attributes associated with a particular service. According to Gil-Gomez et al. (2020), this status should not change depending on the occasion, place, time, or parties providing the service. Research shows that modern healthcare providers face a significant challenge in ensuring consistency in their services because of the rapidly changing demands in the healthcare industry. Additionally, the private sector contains services from different entities. The differences between the private health care providers make it difficult for them to achieve a consistent operational status. The players have different goals and resources to guide their daily operations.

Service consistency is also directly and significantly related to market share performance because it also contributes to customer satisfaction. Studies show that service consistency contributes to an increase in firms' market performance because it is one of the attributes of high-quality service. Another study indicates that service consistency is an important aspect of every business activity because consistent processes help businesses stay focused and organized. According to Gil-Gomez et al. (2020), consistency creates expectations and satisfaction in people depending on a particular service. For this reason, Gil-Gomez et al. (2020) also concluded that service consistency could help a business win loyalty from its customers. Thus, it can lead to high sales volume, high profitability, and reliable growth in the market performance.

Speed of procedures and hospitals' market share performance
Speed of service refers to a metric that measures the time it takes the service providers to complete a specific action. According to Aburayya et al. (2020), speed can be advantageous or disadvantageous to the delivery of health care services. Speed is one of the key factors behind the success of emergency operations within health care settings. On the other hand, high speed can increase the chances of errors during operations and other treatment processes. Therefore, Aburayya et al. (2020) suggest that finding an appropriate balance between the positive and negative effects of speed is the best guide for health care workers. It is also important to note that the balance is not a constant factor but varies widely depending on various conditions. Type of ownership is one of the determinants of this balance.

Speed is directly correlated with the market share performance of the private sector of the local health care industry. Research shows that lengthy cycle time is one of the major factors contributing to the high cost of health care services from the private sector. According to Aburayya et al. (2020), the reduction in the cycle time can lead to a decrease in the cost of these services because of a resultant decrease in demand for facility capacity. In the long run, the reduced cycle time helps the health care providers serve more patients within a unit time and increase customer satisfaction through reduced prices. Hence, it facilitates market performance in the private sector.
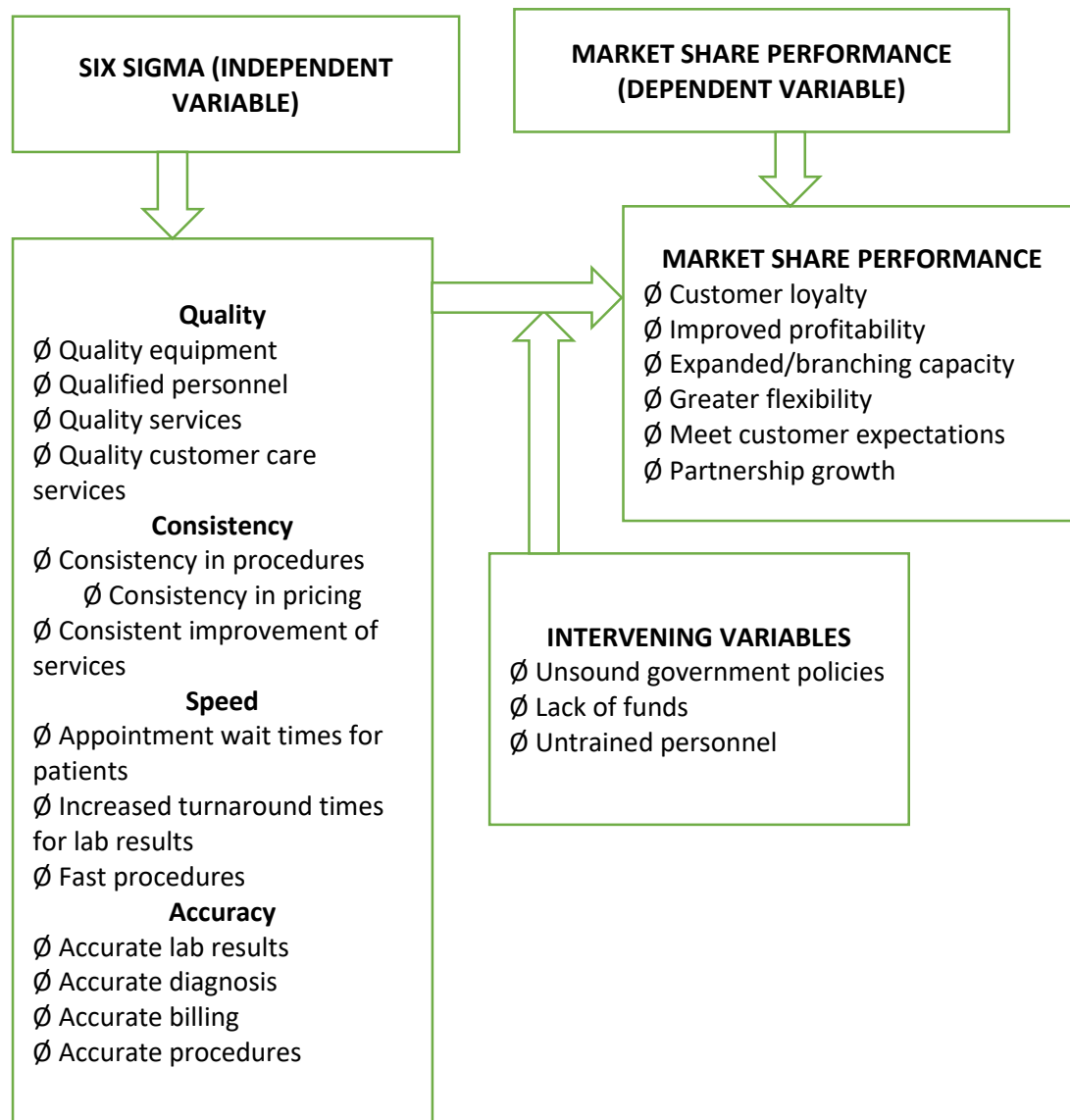
Accuracy of procedures and hospitals' market share performance
The accuracy of service and procedures in the health care practice refers to the extent to which the results of medical and other treatment measures conform to the right standards. Another study also shows that the accuracy of procedures can refer to procedure efficiency because the two teams have overlapping scopes. According to Lee and Yoon (2021), service accuracy is also an attribute of quality service delivery in the health care sector because quality services must be accurate to serve the client's demands. Also, Lee and Yoon (2021) show that the accuracy of procedures in the health care sector is dependent on other medical elements like personnel, resources, and speed.

Accuracy of health care procedures is significantly associated with market share performance because it affects clients' experiences. According to Lee and Yoon (2021), accuracy levels associated with particular services determine the experiences that patients get. In the long run, these experiences influence their perspectives about

similar services in future. Another study shows that service accuracy is directly related to operational efficiency and quality management because it minimizes errors and promotes defect identification in health care practice.

Conceptual Framework

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┌──────────────────────────────┐        ┌──────────────────────────────┐
│  SIX SIGMA (INDEPENDENT      │        │  MARKET SHARE PERFORMANCE    │
│  VARIABLE)                   │        │  (DEPENDENT VARIABLE)        │
└──────────────────────────────┘        └──────────────────────────────┘
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Quality
Ø Quality equipment
Ø Qualified personnel
Ø Quality services
Ø Quality customer care services

Consistency
Ø Consistency in procedures
   Ø Consistency in pricing
Ø Consistent improvement of services

Speed
Ø Appointment wait times for patients
Ø Increased turnaround times for lab results
Ø Fast procedures

Accuracy
Ø Accurate lab results
Ø Accurate diagnosis
Ø Accurate billing
Ø Accurate procedures

MARKET SHARE PERFORMANCE
Ø Customer loyalty
Ø Improved profitability
Ø Expanded/branching capacity
Ø Greater flexibility
Ø Meet customer expectations
Ø Partnership growth

INTERVENING VARIABLES
Ø Unsound government policies
Ø Lack of funds
Ø Untrained personnel

Source: Researcher (2022)
Figure 2: Conceptual Framework

Recap of Literature Review

The primary focus of this chapter was to review literature about the Six Sigma principles and quality, consistency, speed, and accuracy of health care services in relation to hospitals' market performance within the private sector. The review addresses these factors by covering three primary categories – empirical literature review, relative theoretical frameworks, and conceptual framework for the study. The above review shows that lean Six Sigma is a performance improvement methodology that incorporates effectiveness to reduce variation in an existing process. The lean six sigma principles play critical roles in the health care industry because they help the practitioners minimize defects that can lead to medical errors during practice. The DMAIC method refers to a five-stage process that informs the application of the LSS methodologies. This process is essential to health care practices because the above literature reviews indicate that hospitals and individual practitioners rely on the LSS processes and tools to facilitate its effectiveness in design, assessment, implementation of quality improvement activities, and increasing their market performance.

Market share performance refers to the percentage of a particular industry, sector, or field for which a specific entity or business is responsible. This parameter is significantly important because it helps entities

conceive reliable ideas about how powerful, large, or important their businesses are within a particular sector. This study also reviews five theoretical frameworks to guide its analysis on the influence of services' quality, consistency, speed, and accuracy on the market performance of private hospitals in Nairobi. The procedures and processes guiding this study are primarily dependent on the Six Sigma theory. Other theoretical perspectives that were included in this review are the three-factor theory, expectancy theory, social learning theory, and structural contingency theory.

III. RESEARCH METHODOLOGY

Introduction
This section highlights the methodology, design, location, target population, sampling procedures, construction of research instruments, the validity of the instrument, reliability of the instrument, data collection procedure, data analysis, and ethical considerations.

Research methodology
This study employed the triangulation method. According to Natow (2019), triangulation refers to the application of various data sources or methods in qualitative research to create a comprehensive understanding of a particular situation, subject, or phenomenon. Triangulation also defines a qualitative research strategy that tests validity following the convergence of data from multiple sources. Consequently, this study employed this research strategy because it used multiple data sources to enhance a comprehensive understanding of the situation underlying the market performance of private hospitals in Nairobi.

Research Design
This study used a descriptive cross-sectional design to draw the underlying relationship between the dependent and independent variables. The descriptive cross-sectional design is an observational research design that researchers use when providing data to describe the status of a given phenomenon or the relationships characterizing different phenomena at a particular time. As a result, this design can also be thought of as a snapshot of the characteristics and frequency of a given element of the population at a specific time. This design helped the researcher evaluate the effect of independent variables on the dependent variable. The independent variables include the quality, consistency, speed, and accuracy of services, whereas the dependent variable is the market performance of private hospitals in Nairobi.

Target Population and Location of the Study
This study targets the private hospitals within Nairobi County, Kenya. The earlier sections of this report indicate that its primary purpose is to analyze the effect of six sigma implementation on the market performance of private hospitals in Nairobi by using four primary variables – quality, consistency, speed, and accuracy of services. Additionally, all the research objectives and questions in the first chapter of the report are about the private hospitals within Nairobi County. Hence, the research focused on the same population to ensure that it addresses all the questions and objectives. Nairobi County is the best location for this study because it has the largest and the most significant private hospitals in Kenya.

The population size guiding this study results from the information contained on the Kenya Medical Practitioners and Dentists Council's website. The information from this website shows that there are 105 duly registered private hospitals in Nairobi County. On the other hand, the sample size was determined using the following formula (Nishat, 2021):

$$Sample\ size = \frac{\frac{Z^2 \times P(1-P)}{e^2}}{1 + (\frac{Z^2 \times P(1-P)}{e^2 N})}$$

Where;
Z = Z-Score
e = Margin of error
P = Standard of deviation

$$Sample\ size = \frac{\frac{1.96^2 \times 0.5(1-0.5)}{0.05^2}}{1 + (\frac{1.96^2 \times 0.5(1-0.5)}{0.05^2(105)})} = 83$$

Sampling Procedures and Techniques
The study employed a purposive sampling technique to come up with the research participants. Purposive sampling is a non-probability sampling method that depends on the researcher's judgment when determining the

parties that were included or excluded from the participants. According to Guetterman (2020), this technique is significantly reliable in qualitative research because it is cost-effective and time-effective. Recent reports show that Nairobi County has over 105 duly registered private hospitals. However, this study did not involve all private healthcare in the data collection because it is not a census study. Instead, it will focus on 83 well-known and registered private hospitals to collect data about the quality, consistency, speed, and accuracy of their healthcare services (KMPDC, 2022). The inclusion criterion considered the customer reviews on the hospitals' online pages, size, and ownership. Therefore, it included 83 duly registered private hospitals with the best reviews and the largest in size. The above-mentioned criteria was applied to determine the sample size (Nishat, 2021).

Data Collection Procedure

The collection of primary data relied on a semi-structured questionnaire. The researcher used the drop-and-pick-later method to administer the questionnaire to the research participants from the 83 private hospitals within Nairobi. The questionnaire was administered to the corporate and functional level managers of the 83 private hospitals, whereby only one individual was considered from each institution. The corporate management members included procurement managers, finance managers, operations managers, or any other equivalent of the management team members from the hospitals. The table below summarizes the classification of respondents form the private hospitals that were targeted in by the data collection method.

Gender	Population
Male	47
Female	36
Total population	**83**

The questionnaire was the preferred data collection instrument to guide this study because the respondents were literate individuals. Thus, they were able to provide adequate responses to the questions in the questionnaire. The questionnaire was also a reliable data collection instrument for this qualitative study because it could collect a broad range of information within a short period. Additionally, it ensured standardization and guarantees confidentiality by allowing room for anonymity.

Construction of Research Instruments

The questionnaire contained three primary sections – Section A, Section B, and Section C. Section A contained the demographic information of the respondent, while Section B had the hospital's background information. Lastly, Section C had questions about the determinants of the market performance of private hospitals in Nairobi. The questions in Section C of the questionnaire focused on the four independent variables associated with this study. The four variables include quality, consistency, speed, and accuracy of the health care services. The questions in this part sought to understand the impact of the four factors on the market performance of private hospitals within Nairobi County.

Validity and Reliability of the Instrument

This research depended on face validation to test the questionnaire's validity. Face validation is a process of going through the questions in a linguistic and analytical manner to evaluate the factors that should be measured depending on the respondents' understanding. Researchers run this test with a few respondents to see how easily they can comprehend the content in the questionnaire. Hence, this study also applied the face validation process to ensure that the participants were comfortable with the readability, language, formatting, clarity, and other aspects of the questionnaire. Research shows that questionnaires are highly reliable instruments of data collection in qualitative research. For instance, Aithal and Aithal (2020) show that their high-reliability results from their ability to ask similar sets of questions. For this reason, this research used a pilot study to iron out any possible problems relating to the study design.

Reliability test method

Reliability is an important aspect of any research study and is used to ensure the accuracy and consistency of the results. In this research about private hospitals in Nairobi, I used the parallel forms reliability test method to ensure the reliability of my results. The parallel forms reliability test method is a type of test-retest reliability method that involves administering two equivalent forms of the same test to the same group of participants.

To use the parallel forms reliability test method, I first created two versions of the same questionnaire. These two versions were as similar as possible, using the same questions and answer choices. The specific content of the questionnaire was determined by the research objectives. The two versions were shuffled and administered to the same group of participants at two different points in time. To ensure that the two versions were equivalent, I used the same instructions for both versions.

I collected the data from both forms. To determine the reliability of the results, I compared the data from the two forms. If the responses on the two forms are similar, this indicated that the forms were reliable and the results can be used. If the responses are not similar, this indicated that the forms were not reliable and the results may not be accurate.

To ensure the accuracy of the results, I also performed statistical tests on the data. This allowed me to determine the level of agreement between the two forms. I used standard statistical tests such as Pearson's correlation coefficient to determine the level of correlation between the two forms. If the correlation is high, this indicates that the two forms are reliable and the results can be used.

Data Analysis Techniques and Procedures

This research yielded both qualitative and quantitative data. The quantitative data that resulted from the questionnaire was subjected to descriptive statistics. Hence, the researcher analyzed it using SPSS. On the other hand, the qualitative data was analyzed using content analysis. This condition shows that the study also used multiple regression and correlation tools. Regression was used to determine the underlying relationship between the dependent variable and the independent variables. In the long run, the researcher used frequencies, means, and standard deviations to present the data. This research applied the regression model below.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

Y = Market performance

β_0 = Constant of the regression

$\beta_1, \beta_2, \beta_3$, and β_4 = regression coefficients for the independent variables X_1, X_2, X_3, and X_4, respectively.

$X_1, X_2, X_3,$ and X_4 = independent variables quality of service, consistency of service, speed of service, and accuracy of service, respectively.

ε = random error term

Ethical Considerations

The researcher sought permits from all necessary authorities before starting the actual process of data collection from the field. This process included a letter of introduction and a permit from the university. Additionally, the researcher ensured that the participants attained informed consent before they start participating in the research. This condition helped them know what to expect throughout the study. Thirdly, participation was voluntary. As a result, no participant was forced to take part in the research or restricted from quitting the study at a certain. Finally, the researcher held the data collected from participants confidentially.

IV. RESEARCH FINDINGS, ANALYSIS, AND PRESENTATION

Introduction

This section of the report includes the presentation, analysis, and discussion of the research findings. The study's primary purpose was to analyze the effect of six sigma implementation on the market performance of private hospitals in Nairobi. The primary data was collected using a semi-structured questionnaire. The researcher used the drop-and-pick-later method to administer the questionnaire to the research participants from the 83 private hospitals within Nairobi. The questionnaire was administered to the corporate and management members of each of the 83 private hospitals, whereby only one individual was considered from each institution. Data analysis followed the study objectives as shown in the following subsections. Also, the subsections show the classes or categories that guided the presentation of the findings.

Results from pilot test

The research process piloted the data collection instrument among 9 participants before using the results to generate and interpret the Cronbach Alpha Coefficients. The specific coefficients for quality of service, consistency of service, speed of service, and accuracy of service were 0.833, 0.957, 0.961, and 0.799. These values gave an average of 0.888, revealing that the instrument was significantly reliable because the average was higher than 0.7.

Response rate

The study targeted 83 respondents, but only 80 individuals filled in and returned the questionnaires. These parameters indicate that the response rate for the study was 96.4%. According to Ali et al. (2020), a response rate of 70% is reliable to guide conclusions associated with such a study. Thus, the study applied the findings from the 80 respondents to test its hypotheses because the response rate was sufficient.

General information

The primary purpose of this part is to create a basis of the respondents' background information, work environments, and individual capabilities to provide reliable data that can help fulfill this study's objectives. Consequently, it contains information about two main subjects – respondents' demographic data and hospitals' background information.

Gender

The research sought to establish the gender associated with each respondent. The main intention of collecting data on this subject was to help the study ensure fair engagement of all respondents on matters concerning their gender. The following table shows data collected on this subject.

Table 1: Respondents' gender

Gender	Frequency	Percentage
Male	45	56.00
Female	35	44.00
Total	**80**	**100.00**

Source: Primary data (2022)

The above table shows that males represented the majority of research respondents, with 45 (56%) of the total respondents. On the other hand, female respondents made up only 35 (44%) of the respondents involved in this study. This disparity indicates that male health practitioners were more willing to participate in the voluntary study than their female colleagues. However, the disparity did not have statistical significance in influencing the outcomes of this study.

Highest education level

Secondly, the research sought to establish the highest education levels associated with each respondent. The following table shows the data that the research collected on this subject.

Table 2: Highest education level

Education level	Frequency	Percentage
Master's Degree	35	44.00
Bachelor's Degree	29	36.00
College Diploma	16	20.00
Total	**80**	**100.00**

Source: Primary data (2022)

The above table summarizes the information obtained from respondents about their highest level of education. The table's representation indicates that most of the individuals who participated in the study had attained a master's degree. Their population covered 44% (35) of the respondents. On the other hand, the respondents with a bachelor's degree were 36% (29), whereas those that had attained a college diploma as their highest education level constituted 20% (16) only. This information reveals that all respondents had reliable literacy levels to interact with the questionnaire and provide appropriate data for this research.

Age

The research also sought to establish the age brackets characterizing each respondent. The main intention of collecting data on this subject was to help the study facilitate fair engagements of all respondents on matters associated with their age. The following table shows data collected about respondents' age.

Table 3: Respondents' age

Age	Frequency	Percentage
Below 25 years	6	08.00
25 – 34 years	19	24.00
35 – 44 years	26	32.00
45 – 54 years	26	32.00
55 years and above	3	04.00
Total	**80**	**100.00**

Source: Primary data (2022)

The above table reveals that 35 – 44 years and 45 – 54 years were the age brackets with the majority of respondents. Each of the two categories contributed to 32% (26) of the total respondents. On the hand, there were only two (6) respondents with less than 25 years, six (19) with 25 – 34 years, and one only (3) with at least 55

years. This information implied that most individuals serving in management capacities in private hospitals within Nairobi have ages ranging between 35 and 54 years. The table also posits that the respondents were normally distributed across all age brackets.

Respondent's period of service at the hospital

The study sought information about the amount of time that the respondent has taken working for the hospital. The following table summarizes the information obtained on this subject.

Table 4: Respondent's period of service

Period of service	Frequency	Percentage
Below 3 years	6	08.00
3 – 6 years	16	20.00
7 – 10 years	26	32.00
Over 10 years	32	40.00
Total	80	100.00

Source: Primary data (2022)

According to the information represented in the above table, 10 (40%) respondents had been serving their hospitals for more than 10 years. However, only 6 (08%) individuals had covered less than 3 years at their current workplaces. 16 (20%) respondents had stayed at their hospitals for 3 – 6 years, whereas twenty-six (32%) respondents had taken 7 – 10 years. This information implied that most of the respondents had served their hospitals for a significant amount of time. Hence, they were in a position to give credible data concerning this study.

Hospital's period of operation

The research sought to know how long each of the hospitals had been operational. The information from the questionnaire is represented in the table below.

Table 5: Period in operation

Period of operation	Frequency	Percentage
Below 10 years	3	04.00
10 – 24 years	26	32.00
25 – 39 years	38	48.00
40 years and above	13	16.00
Total	80	100.00

Source: Primary data (2022)

From table 4.5 above, most of the hospitals (48%) have been in operation for a period of 25 to 39 years. 4% of the respondents indicated below 10 years, 26 indicated 10 to 24 years, and 13 indicated 40 years and above. This information indicates that most of the hospitals have been operational for long enough to provide the information required in this study.

Bed capacity

The study also sought to realize the bed capacities associated with private hospitals within Nairobi County. Therefore, it asked the respondents to give the number of beds within their respective hospitals. Their responses are represented in the following table.

Table 6: Bed capacity

Bed capacity	Frequency	Percentage
50 – 100 beds	10	12.00
101 – 150 beds	16	20.00
151 – 200 beds	32	40.00
201 beds and above	22	28.00
Total	80	100.00

Source: Primary data (2022)

According to the above information, 12% of the respondents indicated that their hospitals' bed capacities ranged between 50 and 100 beds. 20% indicated 101 – 150 beds, 40% indicated 151 – 200 beds, and 28% indicated 201 beds and above. This information implies that private hospitals within Nairobi County can accommodate a significant number of patients.

Type of Ownership

The next concern during data collection was the type of ownership associated with specific hospitals within Nairobi County. The respondents were asked to indicate whether their hospitals had foreign or local ownership. Their responses are represented in the following table.

Table 7: Type of ownership

Ownership	Frequency	Percentage
Foreign	54	68.00
Local	26	32.00
Total	25	100.00

Source: Primary data (2022)

As represented in table 4.7 above, the majority (68%) of the private hospitals within Nairobi County are owned by foreign entities. On the other hand, only 38% of such hospitals are owned by local entities. This information implies that international trade relations between Kenya and other countries may significantly influence the market performance of private hospitals within Nairobi County.

Total number of workers

The study sought to establish the total number of employees serving various private hospitals within Nairobi County. The information obtained from the respondents is tabulated below.

Table 8: Number of workers

Number of workers	Frequency	Percentage
Below 50 employees	16	20.00
50 – 99 employees	29	36.00
100 – 149 employees	19	24.00
150 – 199 employees	10	12.00
Over 199 employees	6	08.00
Total	80	100.00

Source: Primary data (2022)

According to table 4.8 above, 20% of the respondents indicated that their hospitals had less than 50 employees, whereas 8% of the respondents showed that their hospitals had at least 200 workers. 36% of private hospitals have 50 to 99 workers, 24% have 100 to 149 workers, and 12% have 150 to 199 workers. Thus, this information shows that Nairobi County has a significant number of large and medium-sized private hospitals.

Total number of branches

The study required the respondents to give data concerning the number of branches managed by their hospitals. Their responses are tabulated below.

Table 9: Number of branches

Branches	Frequency	Percentage
Below 5 branches	23	28.00
5 – 10 branches	38	48.00
Over 10 branches	19	24.00
Total	80	100.00

Source: Primary data (2022)

Table 4.9 shows that 28% of private hospitals within Nairobi have less than 5 branches, 48% have 5 to 10 branches, and 24% have over 10 branches. This information implies that private hospitals are distributed over various areas within Nairobi County. The distribution is essential in service delivery because it increases the hospitals' abilities to access public members from different parts of the county.

Quality of service

The study respondents were requested to use a scale of 1 to 5 to show their agreement levels with the following statements about the quality of service (1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = Agree, and 5 = Strongly Agree).

Table 10: Quality of service

Quality of service	Mean	Std. Deviation
The hospital has modern and high-quality equipment.	3.82	0.72
The hospital has highly skilled health care personnel.	3.74	0.86
The hospital offers high-quality treatment services to patients.	3.88	0.72

The hospital offers high-quality customer care services to clients.	3.92	0.68
Average	**3.84**	**0.75**

Source: Primary data (2022)

The above descriptive statistics about the quality of service gives the average mean and standard deviation as 3.84 and 0.75, respectively (M = 3.84, SD = 0.75). This information indicates that the majority of the respondents agreed that their hospitals prioritize quality during their service delivery practices. The statistics are in line with Mohamoud and Mash (2020), who argued that service quality is an external attribute of customers' perceptions that is significantly dependent on their encounters and experiences in getting a particular service. Their study also established that the quality of a particular service does not depend on the final outputs only because clients see it throughout the relative production processes.

Consistency of service
The study respondents were asked to use a scale of 1 to 5 to show their agreement levels with the following statements about the consistency of service (1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = Agree, and 5 = Strongly Agree).

Table 11: Consistency of service

Consistency of service	Mean	Std. Deviation
The hospital has consistent treatment and operational procedures.	3.96	0.66
The hospital has consistent pricing characteristics.	3.74	0.80
The hospital has a consistent improvement in services.	3.80	0.72
Average	**3.83**	**0.73**

Source: Primary data (2022)

The above descriptive statistics about consistency of service give the average mean and standard deviation as 3.83 and 0.73, respectively (M = 3.83, SD = 0.73). This information shows that the majority of the respondents agreed that their hospitals prioritize consistency of treatments and other relative services. These findings agree with Gil-Gomez et al. (2020), who argued that service consistency is an important aspect of every business activity because consistent processes help businesses stay focused and organized. It is also directly and significantly related to market performance because it also contributes to customer satisfaction.

Speed of service
The study respondents were asked to use a scale of 1 to 5 to show their agreement levels with the following statements about the speed of service (1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = Agree, and 5 = Strongly Agree).

Table 12: Speed of service

Speed of service	Mean	Std. Deviation
The hospital has short appointment wait times for patients.	3.52	1.12
The hospital has increased turnaround times for lab results.	3.72	0.92
The hospital has fast procedures.	3.58	1.08
Average	**3.61**	**1.04**

Source: Primary data (2022)

The above descriptive statistics about the speed of service give the average mean and standard deviation as 3.61 and 1.04, respectively (M = 3.61, SD = 1.04). This information shows that the majority of the respondents agreed that fast service is a common characteristic during the delivery of services within their hospitals. The information buys the conclusion of Aburayya et al. (2020), who established that speed is one of the key factors behind the success of emergency operations within health care settings. Additionally, their study concluded that the reduced cycle time helps the health care providers serve more patients within a unit time and increase customer satisfaction through reduced prices. Hence, it facilitates market performance in the private sector.

Accuracy of service
The study respondents were asked to use a scale of 1 to 5 to show their agreement levels with the following statements about service accuracy (1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = Agree, and 5 = Strongly Agree).

Table 13: Accuracy of service

Accuracy of service	Mean	Std. Deviation
The hospital gives accurate lab results.	3.60	1.12
The hospital gives accurate diagnoses.	3.86	0.96
The hospital gives accurate billing.	3.72	0.94
The hospital gives accurate treatment procedures.	3.56	1.14
Average	**3.69**	**1.04**

Source: Primary data (2022)

The above descriptive statistics about the accuracy of service give the average mean and standard deviation as 3.69 and 1.04, respectively (M = 3.69, SD = 1.04). This information indicates that the majority of the respondents agreed that the accuracy of service is an essential element of their treatments and other relative operations. The findings are consistent with Lee and Yoon (2021), who proved that the accuracy of procedures in the health care sector is dependent on other medical elements like personnel, resources, and speed. They also support the conclusions of Gupta et al. (2019), which posit that service accuracy is directly related to operational efficiency and quality management because it minimizes errors and promotes defect identification in health care practice.

Market performance of private hospitals in Nairobi County

The study respondents were requested to use a scale of 1 to 5 to show their agreement levels with the following statements about the market performance of private hospitals in Nairobi County (1 = strongly disagree, 2 = disagree, 3 = moderately agree, 4 = Agree, and 5 = Strongly Agree).

Table 14: Market performance of private hospitals in Nairobi County

Market share performance of private hospitals	Mean	Std. Deviation
Government policies influence the hospitals' operations.	3.72	0.74
Lack of funds affects the hospitals' performance and rate of growth over time.	3.88	0.64
Untrained personnel leads to low levels of customer confidence.	3.78	0.62
High employee professionalism leads to high levels of customer loyalty.	3.76	0.76
Employees' trust helps in meeting customer expectations hence high profitability levels.	3.68	0.76
Expanded facility/branching capacity helps hospitals enjoy greater flexibility.	3.66	0.68
Hospitals that engage in partnerships are likely to enjoy significant market growth.	3.74	0.86
Average	**3.90**	**0.72**

Source: Primary data (2022)

The above descriptive statistics about the market performance of private hospitals in Nairobi County give the average mean and standard deviation as 3.90 and 0.72, respectively (M = 3.90, SD = 0.72). This information indicates that most respondents agreed that the market share performance of private hospitals in Nairobi County is also subject to other external factors such as partnerships, capacity, legal formalities, financial stability, personnel qualifications, customer loyalty, and employees' trust. These statistics are consistent with the structural contingency theory, which posits that any organization's structural contingency plans and decisions are subject to various internal and external influences. Internal influences include the factors that take place within the walls of a particular organization. Some of such factors include the organizational size and job tasks characterizing each worker. On the other hand, external influences include the factors that occur outside the organization but affect its operations.

Normality test

	Count	Skewness	Kurtosis	Standard error
Quality	80	0.34	-0.59	0.016
Consistency	80	0.16	-0.65	0.019
Speed	80	-0.76	-0.42	0.059
Accuracy	80	-0.87	-0.48	0.05
Market share	80	-0.36	-0.8	0.021

The above normality test shows that all kurtosis and skewness values fall between -1 and +1. Hence, the data is appropriate for regression analysis because such a deviation reveals that the results are normally distributed.

Regression analysis

A regression analysis was used to find out the association between six sigma implementation and the market share performance of private hospitals in Nairobi County. The study applied the following regression equation to establish the relationship between dependent and independent variables.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Where;

Y = Market performance

β_0 = Constant of the regression

β_1, β_2, β_3, and β_4 = regression coefficients for the independent variables X_1, X_2, X_3, and X_4, respectively.

X_1, X_2, X_3, and X_4 = independent variables quality of service, consistency of service, speed of service, and accuracy of service, respectively.

ε = random error term

The quality of service, consistency of service, speed of service, and accuracy of service were regressed against market share performance. The results are represented and discussed below.

Table 15: Summary of the regression model

Model	R	R Square	Adjusted R^2 (coefficient of multiple determinations)	Std. error of the estimate
1	0.430	0.185	0.141	0.497

Source: Primary data (2022)

The above table represents the results of multiple regression between the market share performance of private hospitals in Nairobi County (dependent variable) and the cumulative effect of the independent variables – the quality of service, consistency of service, speed of service, and accuracy of service. According to the information in the above table, the four independent variables associated with the study show a 14.1% association between six sigma implementation and the market performance of private hospitals in Nairobi County. This information implies that the other elements not covered in this study can contribute to 49.7%. Hence, the model concurs with Swain and Kar (2018), who argues that patient satisfaction is significantly dependent on multiple factors, including cleanliness, empathy, communication, staff attitudes, medical equipment, and adequacy of medical supplies.

Table 16: Analysis of variance (ANOVA)

Model	Df	SS	MS	F	Significance
Regression	4	3.910796379	0.977699095	4.24813731	0.003742611
Residual	75	17.26107862	0.230147715		
Total	79	21.171875			

Source: Primary data (2022)

This study used ANOVA to realize the significance of the regression model. The analysis leading to the above table establishes an f-significance value of p less than 0.05 (p = 0.003742611 < 0.05). Consequently, the regression model is statistically significant in predicting how six sigma implementation (quality of service, consistency of service, speed of service, and accuracy of service) influence the market share performance of private hospitals in Nairobi County.

Table 17: Coefficients and Significance

Model	Coefficients	Standard Error	t	Significance
Intercept (constant)	3.343949	0.678716	4.926877	4.86E-06
Quality of service	0.309433	0.095692	3.233639	0.001818
Consistency of service	-0.01126	0.092837	-0.1213	0.903781
Speed of service	-0.22678	0.090557	-2.50425	0.014444
Accuracy of service	0.067064	0.081654	0.821318	0.414068

Source: Primary data (2022)

a. Predictors: (Constant), quality of service, consistency of service, speed of service, and accuracy of service
b. Dependent variable: Market performance of private hospitals in Nairobi County

From the above table, the coefficient values for intercept, quality of service, consistency of service, speed of service, and accuracy of service are 3.344, 0.309, -0.011, -0.227, and 0.067, respectively. Therefore, the resultant regression model is shown below.

$$Y = 3.344 + 0.309X_1 - 0.011X_2 - 0.227X_3 + 0.067X_4$$

Where;

$X_1, X_2, X_3,$ **and** X_4 = independent variables quality of service, consistency of service, speed of service, and accuracy of service, respectively

The above regression equation shows that holding constant all the independent variables associated with this study (quality of service, consistency of service, speed of service, and accuracy of service), the other factors influencing the market share performance of private hospitals in Nairobi County will be 3.344 ($p = 4.85589E-06 < 0.05$). This information shows that the market share performance of private hospitals in Nairobi County is hardly subject to other factors. Holding all other independent variables at zero, a unit increase in quality of service leads to a 0.309 ($p = 0.001818224 < 0.05$) increase in the market performance of private hospitals in Nairobi County. Holding all other independent variables at zero, a unit increase in consistency of service leads to a -0.011 ($p = 0.903780532 > 0.05$) decrease in the market share performance of private hospitals in Nairobi County. Holding all other independent variables at zero, a unit increase in speed of service leads to a -0.227 ($p = 0.014443656 < 0.05$) increase in the market share performance of private hospitals in Nairobi County. Holding all other independent variables at zero, a unit increase in accuracy of service leads to a 0.067 ($p = 0.414068365 > 0.05$) increase in the market share performance of private hospitals in Nairobi County.

Additionally, the information from the above table indicates that all the independent variables have a significant relationship with the dependent variable. This argument holds because the significance of regression coefficients was tested at 0.05 and the significance occurred for all cases where the p-value was less than 0.05. Thus, all four independent variables (quality of service, consistency of service, speed of service, and accuracy of service) are good predictors of the dependent variable (market performance of private hospitals in Nairobi County). However, the quality of service is the major coefficient (0.309) among the four independent variables. Hence, the relationship between market share performance and quality of service for private hospitals in Nairobi is more statistically significant than the correlation involving the other three variables.

Discussions of individual objective results

This study is based on four primary objectives. The four objectives include:
  i.   To determine the effect of quality of services on the market share performance of private hospitals in Nairobi.
  ii.   To establish whether consistency affects the market share performance of private hospitals in Nairobi.
  iii. To investigate how the speed of carrying out procedures affects the market share performance of private hospitals in Nairobi.
  iv.   To analyze the effect of the accuracy of procedures on the market share performance of private hospitals in Nairobi.

The above findings and discussions indicate that the studied hospitals had embraced the Six Sigma Theory in their operations. The discussions also indicate that the primary elements of implementing the Six Sigma Theory in the health care practice include quality of service, consistency of service, speed of service, and accuracy of service. Consequently, these elements are significant determinants of the size of the market share performance associated with the private hospitals within Nairobi County. The following discussion discusses each of the above objectives based on the study findings and relevant information from empirical research.

Quality of service on the market share performance of private hospitals

At the significant level of 5% (alfa = 0.05), the study found that the quality of service (beta = 0.309, p<0.05) has a statistically significant effect on the market share performance of private hospitals in Nairobi County. The information implies that any practice or condition that can facilitate the quality of service within the private hospitals in Nairobi County would also lead to a significant increase in their market share performance. This relation proves the conclusions from Mohamoud and Mash (2020), which claim that service quality in the health care industry is directly correlated to market share performance because the resultant increase in satisfaction leads to a rise in customer loyalty levels. Their study also identified an active correlation between the quality of services and market performance because customer loyalty is a subject of customer satisfaction. Additionally, sales volume and market share performance are subjects of customer loyalty.

Consistency of service on the market share performance of private hospitals

At the significant level of 5% (alfa = 0.05), the study found that the consistency of service (beta = -0.011, p>0.05) has a statistically significant effect on the market share performance of private hospitals in Nairobi County. This information implies that any practice or condition that can facilitate the consistency of services

within the private hospitals in Nairobi County would also significantly increase their market share performance. The empirical research supporting these results posits that consistency associated with a particular service should not change depending on the occasion, place, time, or parties providing the service. Additionally, research shows that modern healthcare providers face a significant challenge in ensuring consistency in their services because of the rapidly changing demands in the healthcare industry.

Speed of service on the market share performance of private hospitals

At the significant level of 5% (alfa = 0.05), the study found that the speed of service (beta = -0.227, $p<0.05$) has a statistically significant effect on the market share performance of private hospitals in Nairobi County. This information implies that any practice or condition that can facilitate the speed of services within the private hospitals in Nairobi County would also lead to a significant increase in their market share performance. A study by Lee and Yoon (2021) supports these results because it shows that speed is significantly correlated with the market share performance of the private sector of the local health care industry. Its findings show that lengthy cycle time is a major factor contributing to the private sector's high cost of health care services. Hence, the reduction in the cycle time can lead to a decrease in the cost of these services because of a resultant decrease in demand for facility capacity.

Accuracy of service on the market share performance of private hospitals

At the significant level of 5% (alfa = 0.05), the study found that the accuracy of service (beta = 0.067, $p>0.05$) has a statistically significant effect on the market share performance of private hospitals in Nairobi County. This information also implies that any practice or condition that can facilitate the accuracy of services within the private hospitals in Nairobi County would also significantly increase their market share performance. These findings also have a solid empirical basis because a study by Gupta et al. (2019) shows that service accuracy is also an attribute of quality service delivery in the health care sector – quality services must be accurate to serve the client's demands. Another study by Swain & Kar (2018) indicates that the accuracy of procedures in the health care sector is dependent on other medical elements like personnel, resources, and speed. Hence, the accuracy of health care procedures is significantly associated with market share performance because it affects clients' experiences.

Links with other empirical studies

Although the Six Sigma approach was first applied in Motorola's business management processes, this research has revealed that it can also be a reliable remedy for healthcare centers struggling with their low market performance levels. The findings also align with conclusions from other empirical studies concerning performance management and factors influencing operational efficiency in the healthcare sector. For example, Mohamoud and Mash (2020) proved that service quality in the health care industry is directly correlated to market performance because the resultant increase in satisfaction leads to a rise in customer loyalty levels. Additionally, a study by Gupta et al. (2019) shows that service accuracy is also an attribute of quality service delivery in the health care sector – quality services must be accurate to serve the client's demands. Another study by Swain & Kar (2018) indicates that the accuracy of procedures in the health care sector is dependent on other medical elements like personnel, resources, and speed. However, the findings deny conclusions from a study by Lee and Yoon (2021), which show that speed is directly correlated with the market share performance of the private sector of the local health care industry. However, this difference does not influence the effectiveness of the findings because high speed of service can also be a disadvantage to the overall market performance by increasing the rate of erred treatments.

New knowledge and link with research gap

The findings and analyses in the above sections reveal that the quality of service is more reliable than consistency, accuracy, and speed of service in predicting market share performance for private hospitals in Nairobi County. This conclusion is valid because this aspect has the highest coefficient (0.309) as shown on Table 17. Additionally, the above findings also link with research gap associated with this study because they reveal that the unreliability of quality, consistency, speed, and accuracy of healthcare services are significant predictors of market share performance for private hospitals within Nairobi County. Additionally, past studies reveal that hospitals' reliance on the Six Sigma principles reduces their vulnerability to poor market share performance because it enables them to improve in such aspects quality, consistency, speed, and accuracy of healthcare services. As such, their low performance levels in the above four aspects cause adverse effects to their market share in the long run.

V.   SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter summarizes the findings, conclusions, and recommendations associated with the study. It uses the research finds to draw conclusions and give recommendations for practice and further research concerning this field of study. These elements are summarized in the following subsections.

Summary of the result findings

The majority of the respondents agreed that their hospitals prioritize quality during their service delivery practices (M = 3.84, SD = 0.75). Some common features characterizing service quality include equipment, personnel, treatment, and customer care. Secondly, the majority of the respondents agreed that their hospitals prioritize consistency during their service delivery practices (M = 3.83, SD = 0.73). Some common features characterizing service consistency include procedures, pricing, and improvement. The majority of the respondents also agreed that their hospitals prioritize speed during their service delivery practices (M = 3.61, SD = 1.04). Some of the common features defining the speed of service include procedures, appointment wait times, and turnaround times for lab results. Fourthly, the majority of the respondents agreed that their hospitals prioritize accuracy during their service delivery practices (M = 3.61, SD = 1.04). Some of the common features illustrating the accuracy of service include lab results, diagnoses, billing, and treatment procedures. The study also established that quality of service (beta = 0.309, $p < 0.05$), consistency of service (beta = -0.011, $p > 0.05$), speed of service (beta = -0.227, $p < 0.05$), and accuracy of service (beta = 0.067, $p > 0.05$) have significant influence on the market share performance of private hospitals in Nairobi County.

Conclusions

In conclusion, most private hospitals within Nairobi County implement the Six Sigma Theory because they prioritize quality, consistency, speed, and accuracy of service in most of their operations. For instance, quality of service has been embraced by most of the private hospitals in Nairobi County. This condition has motivated hospitals to have high-quality equipment, skilled health care personnel, high-quality treatment services, and high-quality customer care services. However, information from empirical research shows that health care processes are poorly designed and characterized by unnecessary duplication of services, long waiting times, and delays. This condition prevails because the market share performance of private hospitals in Nairobi County is also subject to such other external factors as partnerships, capacity, legal formalities, financial stability, personnel qualifications, customer loyalty, and employees' trust.

Recommendations for practice

Following the insights from the above findings and analyses, legal authorities, private entities, and non-governmental authorities within Nairobi County and the neighboring communities have a central role to play in growing the market share performance of private hospitals within Nairobi County. For instance, the county and national governments should employ policies that promote the hospitals' operations. Some of such approaches include licensing all healthcare practitioners and involving the private sector in the procurement of healthcare resources. Hence, the policies can help in growing the market share performance of private hospitals because they help them minimize expenses, maximize profits, and increase performance levels.

On the other hand, owners of private hospitals should keep up prioritizing quality, consistency, speed, and accuracy of service in all of their operations. These elements are primary determinants of the hospital's ability to achieve customer loyalty. Also, non-governmental agencies and not-for-profit organizations should collaborate with private for-profit health care entities in improving the delivery of health care services to public members. Some of the possible areas of collaboration include procurement, referrals, and research and development. Such operational approaches will help the private hospitals in Nairobi County to command a bigger market share performance.

Recommendations for further research in this field of study

As noted in earlier stages of this study, empirical research shows that health care processes are poorly designed and characterized by unnecessary duplication of services, long waiting times, and delays. This condition prevails because findings and analyses from this study indicate that the market share performance of private hospitals in Nairobi County is also subject to such other external factors as partnerships, capacity, legal formalities, financial stability, personnel qualifications, customer loyalty, and employees' trust. Empirical research also suggests that patient satisfaction is significantly dependent on multiple factors, including cleanliness, empathy, communication, staff attitudes, medical equipment, and adequacy of medical supplies. This information proves that the market performance of private hospitals is dependent on both internal and external factors. Consequently, future research in this field of study should evaluate the significance of external factors in influencing six sigma implementation within private hospitals.

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