

AN ASSESSMENT OF THE IMPACT OF TOTAL QUALITY MANAGEMENT PRACTICES AT PARKVIEW PREMIER CLINICAL LABORATORIES

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Abstract

Stiff competition in a tough economic environment was a key driver for Parkview Clinical Laboratories to introduce total quality management (TQM) as an integrated management approach to continuously improve performance of products, processes and services ultimately yielding and surpassing customers' expectations. This study sought to assess the impact of TQM practices in improving healthcare service delivery at Parkview Clinical Laboratories against the Stepwise Laboratory Improvement Process towards Accreditation (SLIPTA) framework. Other drivers for TQM included but not limited to: increased customer complaints as a result of delayed turnaround times, unreliable service delivery and erroneous laboratory results.

Literature on total quality management principles such as Kaizen stepwise continuous improvement, Lean management and six sigma principles and the WHO-AFRO SLIPTA model provided a framework for the study. The study conducted a baseline study against the SLIPTA constructs to measure service quality at three intervals. A customer survey was done to obtain quantitative data pertaining to customer needs and satisfaction whose constructs were guided by the gap model. Research elements were stratified according to profession to ensure representation of various services. To assess customer satisfaction whose constructs were guided by the gap model, and also to capture customer needs and complaints, the quantitative approach was also adopted. This enabled responses to be statistically analysed to determine their significant levels and to classify the need and complaints of gap analysis.

The quantitative research approach was also chosen after considering the large sample size, in order to provide accurate and valid data representative of the target population using structured instruments like questionnaires.

Customer surveys sought to identify and group the customer needs decision making. Hence quantitative analysis of the complaints was very important to measure the gravity of service gaps.

The clients were classified by profession and site and included clinicians from all sites and specialities, nurses, receptionists and laboratory personnel. Stratification was done to triangulate the findings between the strata. All customer complaints were logged and assessed using SPSS statistical method. To assess the applicability of the SLIPTA model, the SLIPTA checklist was used qualitatively as an audit tool for assessing the quality of processes with the aim of identifying bottlenecks so that they could be eliminated. Six sigma and lean management principles, quality assurance policies and principles were introduced as a way of intervention to improve work area management, laboratory methods, processes and all areas pertaining to improving service quality. The SLIPTA model was found to be an effective tool for implementing TQM in the laboratory with immediate result improvements being noted all round within two months after intervention. The improvements in result accuracy, service reliability and improved turnaround times improved the customer satisfaction index from 90% to 95%. TQM practices and principles introduced by the SLIPTA model are applicable in resource limited set ups like Parkview Laboratory ensuring improvements in the quality service delivery to improve customer satisfaction and loyalty. TQM has a positive impact of improving the quality and efficiency of laboratory services leading to customer satisfaction which is the foundation of building customer loyalty and firm growth and profitability.

By employing the SLIPTA model to attain accreditation, Parkview Laboratory may become the first accredited laboratory in Zimbabwe, giving it a sustainable competitive advantage in a tough economic environment. High quality standards would open strategic partnerships in both local and regional markets especially with researchers. This would increase the firm's profitability. The systematic stepwise continuous improvements provided by the SLIPTA model make it a recommended tool for improving laboratory service delivery and customer satisfaction. Hence it is recommended as the tool of choice for achieving accreditation at Parkview Laboratory.

Introduction

Since dollarization in 2009, Zimbabwe has become a centre of attraction for outside investors in all sectors including health services. Globalization has ushered in companies from neighbouring South Africa which offer state of the art equipment and laboratory services. These laboratories have higher learning curves due to a lot of experience and higher technological exposure. As such Premier Services Medical Investments (PSMI) which owns Parkview Clinical laboratory Private Limited is facing stiff competition in a tough economic environment. The only way to increase profitability and maintain sustainable business growth in such an environment is to increase value to both the clients and the firm by increasing the quality of its products (laboratory results) as well as its laboratory service delivery. This project seeks to examine how total quality

LITERATURE REVIEW

Introduction

The literature review presents models, concepts, approaches and theories that provide a framework of the study. This chapter presents literature on the history and development of total quality management systems; principles and pillars of TQM; the SLIPTA model and its application in clinical laboratories. It also includes the examination of current TQM practices at Parkview Laboratory and the factors affecting the quality of laboratory services in a bid to identify service gaps. The service gap theory is analysed and applied as a tool for measuring gaps in service delivery at Parkview Laboratory. By measuring, managing and minimising these gaps, the firm intends to improve customer satisfaction.

History and Development of TQM

Hashmi, (2010) defines total quality management as a management philosophy that seeks to integrate all functions of an organization such as finance, human resources, operations and marketing in order to focus on meeting customer needs and organizational objectives. According to Hashmi, (2010) for successful implementation, the total quality management culture requires quality in all aspects of the company's operations with processes being done right the first time to ensure that defects and waste are eradicated and costs reduced. The Kaizen philosophy of total quality management involves systematic and long term commitment by all stakeholders to ensure continuous improvement through stepwise participatory approach to improve the day to day activities. This has been shown to result in sustainable competitive advantage to any organization that learns and applies its principles and practices (Agus, 2004:615-628). Evidence from studies by Prajogo and Sohal,(2003:901-918); Anthony, (2002:551-556) and Tsang and Anthony,(2001:132-141) shows that most organizations like Toyota and Ford who applied these principles learnt from Deming, Juran and Feigenbaum were able to increase efficiency in the workplace resulting in increased productivity, profitability and customer satisfaction.

Based on these facts, the application of total quality management at Parkview Clinical Laboratories was adopted with the desired effect of increasing productivity, improving customer satisfaction and for creating a sustainable competitive advantage as a result of provision of high quality results and customer services. This in turn was expected to translate into the firm's growth and profitability.

Total Quality Management Framework

According to Moughazy (2005:1-3) a TQM framework should compose of the following five attributes:

- **Quality Planning (QP)** which is necessary for standardizing the remedy, establishing measures for monitoring performance and ensuring that the performance achieved satisfies the quality requirements. This system also ensures the documentation of the new quality laboratory processes thus ensuring continued quality results. Agus,(2004:617) emphasizes that while the framework exists for establishing quality, unless management specifies its target goals to evaluate the performance of the existing processes versus the desired outcomes, no improvement will occur. The SLIPTA framework like Agus (2004:615-628), recommends the concept of quality planning at strategic management levels to ensure success of TQM implementation.
- **Quality Laboratory Processes (QLP)** includes analytical processes, general policies, practices and procedures that define how all aspects of the work get done. (Moughazy, 2005; 1-3). These are established by management in consultation with regulatory health bodies like Health Professional Council and Health Advisory Board to ensure laboratories align with legal processes for quality laboratory operations and safety. Quality laboratory processes enforce that all new testing methods introduced by a laboratory, be assessed, tested for quality and be standardised before being used for patient analysis, so as to ensure patient safety- (Baily, 2007:666).

This empowers management to enforce total quality management, by ensuring that documents on system policies and standard operating procedures are clearly defined to

enable staff to implement desired quality practices. The SLIPTA model advises in its management checklist that these be available without fail as it represents evidence of management support for total quality management programmes which is one of the critical success factors of TQM implementation.

- **Quality Assurance (QA)** represents a broad spectrum of plans, policies and procedures that together provide an administrative structure for a laboratory's efforts to achieve quality goals. According to Shakya- (2012), quality assurance is intended to ensure reliability of laboratory tests by implementing measures which detect and eliminate errors in all stages of process mapping. By monitoring all phases of laboratory testing (the pre- analytical, analytical and post-analytical phases) it eliminates external sources of error such as wrong patient identification, processing wrong specimen, transportation defects and other errors introduced during specimen handling, transportation, sorting, processing or post analytical transcriptional error - (Moughazy, 2005:1-3). It is concerned with broader measures and monitors of laboratory performance such as:

- turnaround time
- specimen identification,
- patient identification
- specimen identification and
- Test utility (tests whether a laboratory is maximizing good and minimizing harm to the patients)- (Brooke; 2008)

Because quality is in-built, quality assurance is recommended as a system that uses quality improvement tools to enable identification of the cause(s) of problems at all the levels of testing. These challenges can then be eliminated through quality planning. It also ensures the use of quality controls to detect problems early enough to prevent their consequences- (Moughazy, 2005:1-3). The SLIPTA model also made similar requirements concerning expected quality assurance.

- **Quality Control (QC)**

Tietz, (2007) and the SLIPTA model both recommend use of quality control charts (Shewhart's Levy Jennings and process control charts) to assess all laboratory analytical processes for accuracy. QC can be internal or external and represents techniques and procedures for monitoring performance parameters as a way of alerting laboratory personnel when there are indications that quality is deteriorated- (Shakya, 2012). According to Shakya, (2012), analytical errors contribute between 20-30% of the total error in laboratory testing. Shakya advises that many analytical variations must be controlled carefully to assure that analytical methods produce accurate measurements. As such internal quality controls should be processed daily in all laboratory processes to ensure accurate reliable result release, once QC has been tested under similar conditions to that of patient specimens and passes. Use of L-Jennings charts have proven useful in detecting random and systematic errors before patient tests are released as recommended by the six sigma TQM principles- (Agus, 2004:615). External controls on the other hand are recommended for benchmarking.

Assessment of quality controls at Parkview Laboratory is to be done to provide baseline data and to provide information on how best to improve the current quality systems.

- **Quality Improvement (QI)** system provides a structured problem-solving process for identifying the root cause of a problem and also for identifying a remedy for the problem. It

uses such scientific tools as the Plan-Do-Check-Act (PDCA) cycle or the 5 WHY's and "2" "HOW's to identify the source of problem then ensures that remedial action to alleviate the immediate problem is adopted. It also ensures corrective and preventive action is taken, which should be standardized and communicated to all personnel for adoption on a continuous improvement plan basis- (Burtis, 2002). The SLIPTA model recommended the use of such instruments.

If Parkview Clinical Laboratory could adopt and enforce these five attributes of TQM using the SLIPTA model, a culture of quality could result, thereby improving service delivery and marking the beginning of a journey towards sustainable competitive advantage. This would also go a long way in improving the firm's problem solving procedures and techniques.

2.4 Principles of Total Quality Management

TQM principles include lean management whose primary role is to eliminate waste and increase process efficiency; the Kaizen for stepwise continuous improvement and the Six Sigma Deming principle more concerned with detection and elimination of analytical errors to improve result accuracy- (Schweikhart and Dembe, 2009:748-755).

2.4.1 Lean Management

Lean management is based on Toyota's philosophy that reducing lead times and focusing on keeping the production line flexible, produces better quality, responsiveness, productivity and maximizes utilization of staff, equipment and space- (Erhabor and Adias, 2012:115-202). It addresses the workplace space, cleanliness and order; workflow and work processes, to ensure that there is smooth workflow, increase speed and minimal time wastage in staff motion and machine idle time.

According to Erhabor- (2012:115-202) about 70% of patient management decision making is dependent on laboratory results. Improvements in laboratory processes to increase efficiency while providing accurate and reliable results can have significant effects on patient waiting time. In critical care departments like Casualty; Emergency and Paediatric sections of hospitals this can have life determining impact. Hence lean management is a necessary quality management system at Parkview laboratory. Its ability to detect bottlenecks and wastage in laboratory processes and systems enables management to quickly identify processes and systems which need improvement so as to establish more efficient systems- (Journal of Pakistan Medical Association; 2006).

By optimal use of these principles, Parkview Clinical laboratories could reduce wastes such as:

- Injuries due to an unsafe work environment.
- Motion –unnecessary human motion in the work areas due to poor planning.
- Inventory –stock outs and overstocking; time wasted by batching samples leading to increased turnaround times.
- Defects such as re-bleeds or samples that need repeating.
- Over-servicing – doing unnecessary laboratory tests.
- Delayed patient discharge/ treatment- from hospitals, due to delayed turnaround times of laboratory results.

The SLIPTA Model as a TQM Implementing Framework

The ISO 15189 Stepwise Laboratory Quality Improvement towards Accreditation (SLIPTA) framework has been developed by World Health Organization (WHO) as the ideal tool for standardizing clinical laboratory systems and processes internationally. WHO is currently working with many governments including the Zimbabwean Ministry of Health in its campaign for the implementation of these standards as a step towards accreditation of state laboratories? Accreditation is a procedure by which an authoritative body gives formal recognition that a laboratory is competent to perform specific tasks for which the laboratory claims proficiency. (www.iso17025.info: 2013).

This however does not guarantee that a given analytical result is correct but it does establish standards that must be met and a framework approach to detect non-conformities when they occur. According to ISO17025, accreditation means that released laboratory results are defensible to a recognized standard that does not change when laboratory personnel or circumstances change.

Therefore accreditation is a measure of the presence of total quality systems in a specific laboratory. Since PSMI Parkview Clinical laboratories have plans to enrol its laboratories for accreditation using the SLIPTA model, this project acts as a pilot project to test the feasibility of the implementation of the SLIPTA principles and guidelines to test if they work in the Zimbabwean environment; to identify any gaps in the framework as well as any further requirements which need to be budgeted for when the firm uptakes the actual accreditation programme.

Advantages of the SLIPTA Framework as a Tool for Implementing TQM

Investigation of the SLIPTA framework revealed that it was designed specifically for clinical laboratories with the primary goal of providing better patient management and customer satisfaction by developing a laboratory that ensures smooth, efficient and uninterrupted laboratory services in a clean, safe and functional work environment using validated, well maintained and calibrated equipment to ensure accurate dependable results are produced.

Through this framework, process mapping of all laboratory processes was recommended to identify pitfalls in current laboratory processes so as to improve laboratory turnaround times. In order to achieve this, its primary thrust was to offer training to equip laboratory and support personnel to produce and build a culture of total quality management. According to ISO 15189 standards, the SLIPTA training programmes were designed to offer task based curriculum; to ensure hands-on and activity driven workshops which are structured in a manner that allow organizations time for training followed by implementation periods. Training and improvement projects are segmented to allow for stepwise continuous improvement and flexibility to ensure firms accomplish total quality management goals at their desired pace as their budget permits.

This reduces the financial burden and allows planning for TQM implementation in phases suitable to the firm which is usually the reason why firms fear to implement TQM as they find it expensive.

The ISO 15189 based SLIPTA model was also designed to offer mentoring and on bench coaching by WHO certified trainers who also act as external quality auditors. The mentors offer continued

support to ensure that laboratories working towards accreditation, comply to set standards such as document and record management which is very vital for measuring improvements. It is the role of the mentors to ensure that management is kept focused on fulfilling their commitment to implement the required quality management practices according to agreed schedules. Parkview Clinical Laboratories chose to partner with Zimbabwe International Quality Assurance Programme (ZINQUAP) to provide these services to help achieve desired outcomes within the next two years. The SLIPTA framework uses the stepwise approach for change management and implements the 5S-Kaizen total quality management technique to ensure a value creating organization.

RESEARCH METHODOLOGY

Target Population and Sampling

The target population consisted of 250 people out of which a sample of 150 were selected, distributed as shown in Table 3.3. These were staff from two hospitals, five clinics, two medical centres and twenty surgeries which were randomly selected.

Table 3.2 Target Population and Sample

No	Description	Total
1	Laboratory Personnel	30
	• Scientists	10
	• Receptionists	4
	• Nurses	5
	• Couriers	4
	• Senior management	4
	• Support staff	3
2	Clinicians	70
	Gynaecologists	10
	Paediatricians	10
	Physiologists	10
	Other Specialists	10
	Surgeons	10
	General clinicians	20
3	Nurses	40
	Medical centres	10
	Hospitals	10
	Surgeries	15
	Clinics	5
4	Receptionists (Surgeries & clinics)	10

Conclusion

Though TQM tools and methodologies were identified for collecting data, it was necessary to translate the data into information that could be used for decision making. As such, the results obtained had to be analysed and interpreted using statistical methods to provide information that could be useful to management. The next chapter relates to the results interpretation and discussion of these findings.

DATA ANALYSIS AND INTERPRETATION

This section chapter presents data analysis, discussion and interpretation in two parts. The first part presents data from the Laboratory audits against the SLIPTA checklist and the suitability of the model for accreditation. The second part presents data analysis, discussion and interpretation after baseline survey on customer needs and requirements as well as findings after implementation of TQM. Observation findings from laboratory audits using the SLIPTA checklist are presented first followed by questionnaire findings which are summarised into graphs and tables to indicate customer needs and complaints.

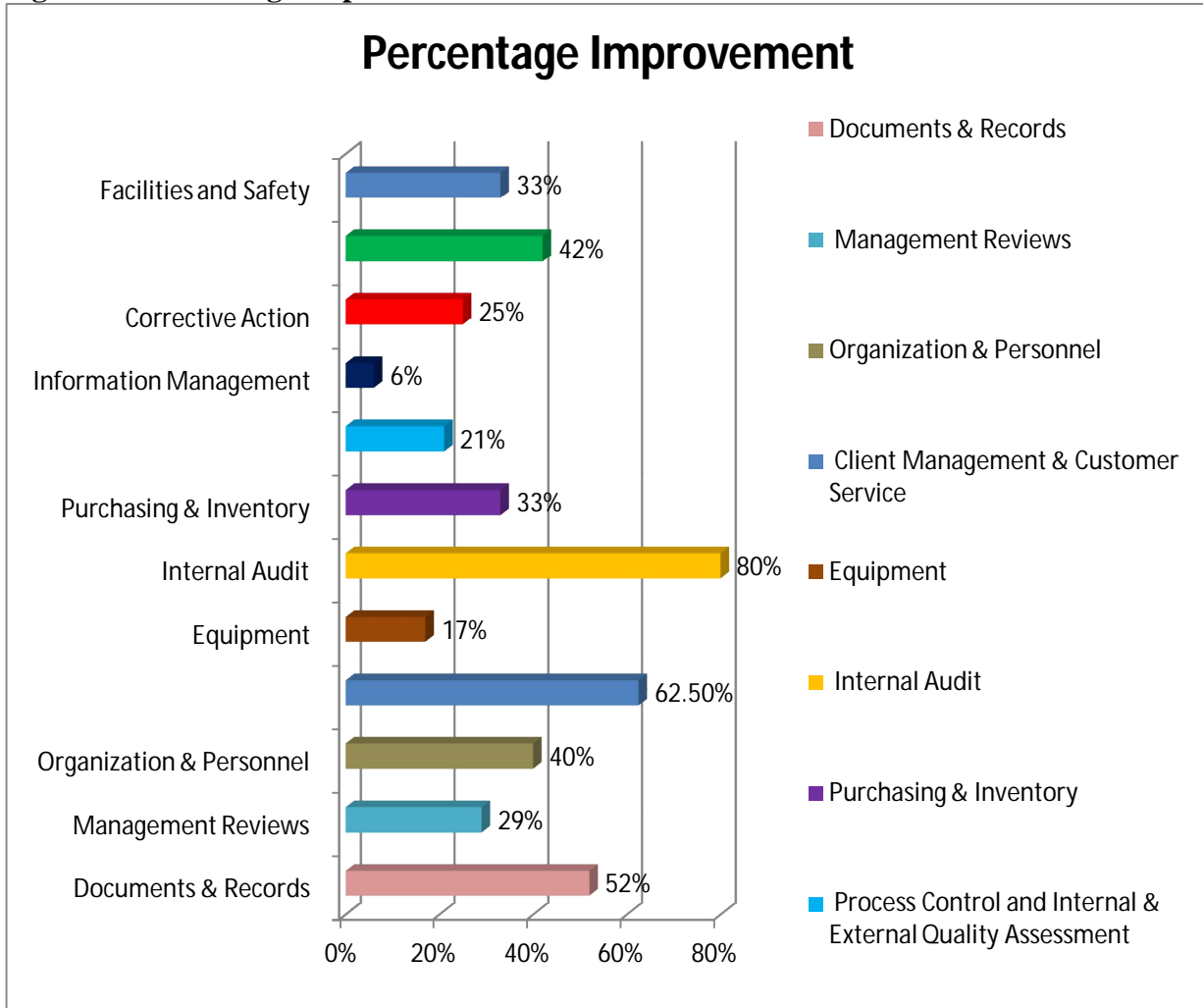
Presentation of Findings

Table 4.1 SLIPTA Results of Baseline Data versus Post-intervention

AUDIT Results for Parkview Clinical Laboratory for period 1 May 2013- 31July 2013					
Audit Score Sheet					
Section		Total Points At Baseline(May 2013)	Total Points after TQM at 31July 2013 TQM	% Improvement in Area being measured.	
Section 1: Documents & Records		4/25	17/25	52%	
Section 2: Management Reviews		3/17	8/17	29%	
Section 3: Organization & Personnel		5/20	13/20	40%	
Section 4: Client Management & Customer Service		2/8	7/8	62.5%	
Section 5: Equipment		19/30	24/30	17%	
Section 6: Internal Audit		0/10	8/10	80%	
Section 7: Purchasing & Inventory		7/30	17/30	33%	
Section 8: Process Control and Internal & External Quality Assessment		17/33	24/33	21%	
Section 9: Information Management		9/18	11/18	6%	
Section 10: Corrective Action		4/12	7/12	25%	
Section 11: Occurrence/Incident Management & Process Improvement		3/12	8/12	42%	
Section 12: Facilities and Safety		12/43	26/43	33%	
TOTAL SCORE		91/258	170/258	31%	
No Stars (0 – 142 pts) < 55%	1 Star (143 – 165 pts) 55 – 64%	2 Stars (166 – 191 pts) 65 – 74%	3 Stars (192 – 217 pts) 75 – 84%	4 Stars (218 – 243 pts) 85 – 94%	5 Stars (244 – 258 pts) =95%
No Star at baseline		2 Stars after TQM 3months			

Findings from Table 4.1 show that at baseline Parkview Laboratory scored an actual 91 points out of a possible of 258 (35%). This represented zero stars on the WHO-AFRO SLIPTA star scale. Two to three months after total quality management intervention, the laboratory scored 170/258 representing (65%) or two stars and a 31% improvement from the baseline score. This is in line with one of the goals of SLIPTA management framework, which is to strengthen laboratory management by SLMTA training to achieve immediate laboratory improvement and accelerate the process towards accreditation readiness. The positive impact of introducing total quality management using the SLIPTA model can thus be measured as noted by improvements in laboratory processes, client services and client satisfaction.

Figure 4.1 Percentage Improvement



Findings from Figure 4.1, show that though all audited areas showed a general improvement, the most improved management area was the internal audits from the quality assurance department which improved by 80%. Client and customer services management also improved by approximately 63% while documents and records management improved by 52%. Focus on these areas was necessary to ensure that systems were established to meet customer needs and to enable staff to offer quality services that satisfy customers. Documents and records involved among other things, the development of policies on quality management and standard operating procedures

which lay the foundation for introducing total quality management practices such as quality assurance, quality planning, quality control systems and quality improvements. Once in place quality policies would standardise work processes and achieve all other goals. Occurrence, incidence and improvement management was also an important area to focus on, to empower staff to diagnose the root causes of problems and map out the appropriate corrective action using the PDCA cycle. This improved by 42%. As recommended by Talib, (2010) and Agus, (2004) a positive change in these areas would ensure rapid and structured improvements which are sustainable in line with the firm's goal of increasing quality as a competitive strategy.

The improvement in all areas under study is an indication of staff buy-in coupled with management support as indicated by Talib, (2010) who claimed that management support and staff buy-in are critical success factors of TQM implementation programmes. Without this support, no matter how good the model was, it might have failed to be implemented properly. Given more time, better results could be achieved.

Table 4.1 and Figure 4.1 indicate that the SLIPTA model enabled the effective implementation and monitoring of quality systems at Parkview Laboratory as recommended by ISO Standard 15189. This indicates that the SLIPTA model is flexible and adaptable to the Zimbabwean economic environment thus enabling global quality standards in clinical laboratories to be achieved for improved healthcare service delivery. That being the case, the SLIPTA model can be recommended as a tool for achieving accreditation at Parkview Laboratory if backed up by SLAMTA trainings and help from WHO-AFRO trained mentors to keep both the management and staff focused on fulfilling their desired goals and objectives of getting accredited.

Result Delivery Measured by Turnaround Times

Findings on turnaround times of routine, urgent and special tests as per site and profession of clients showed the following:

Figure 4.2 Urgent Result Turnaround Time

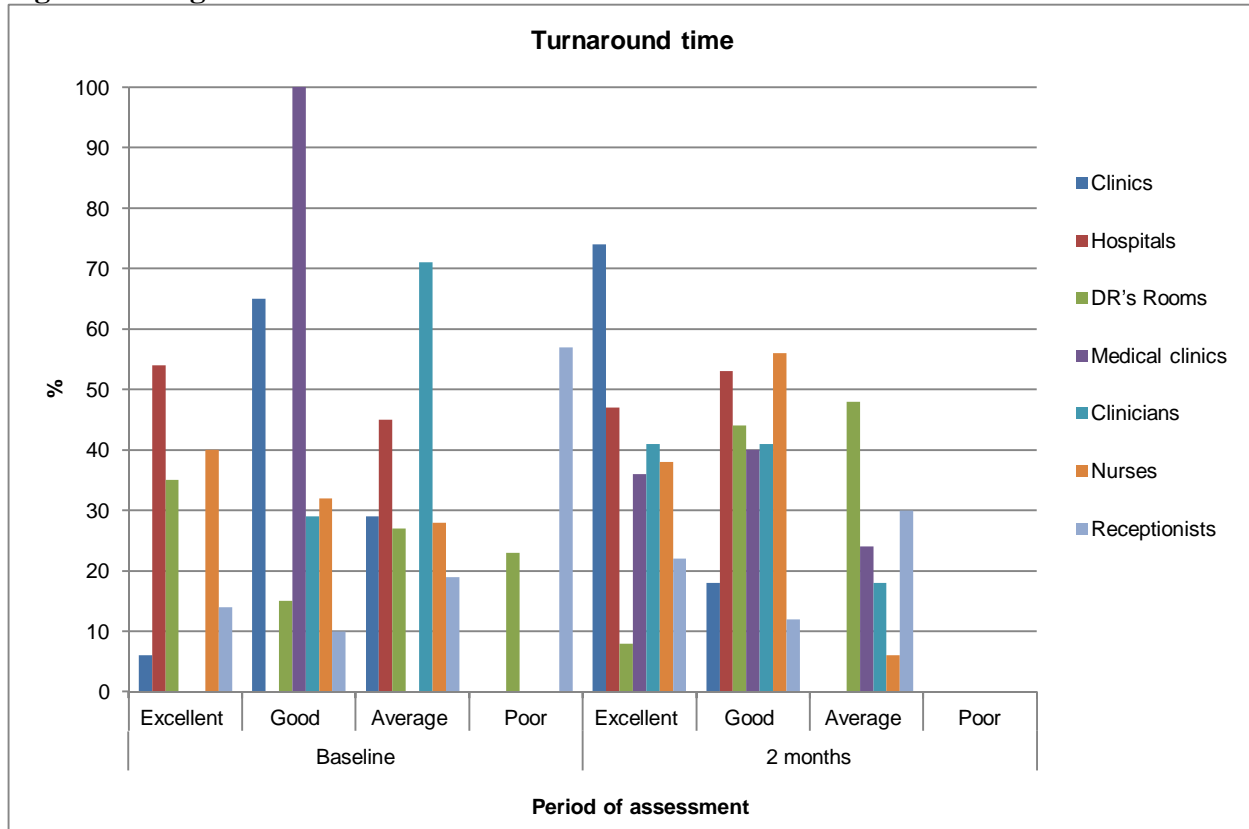


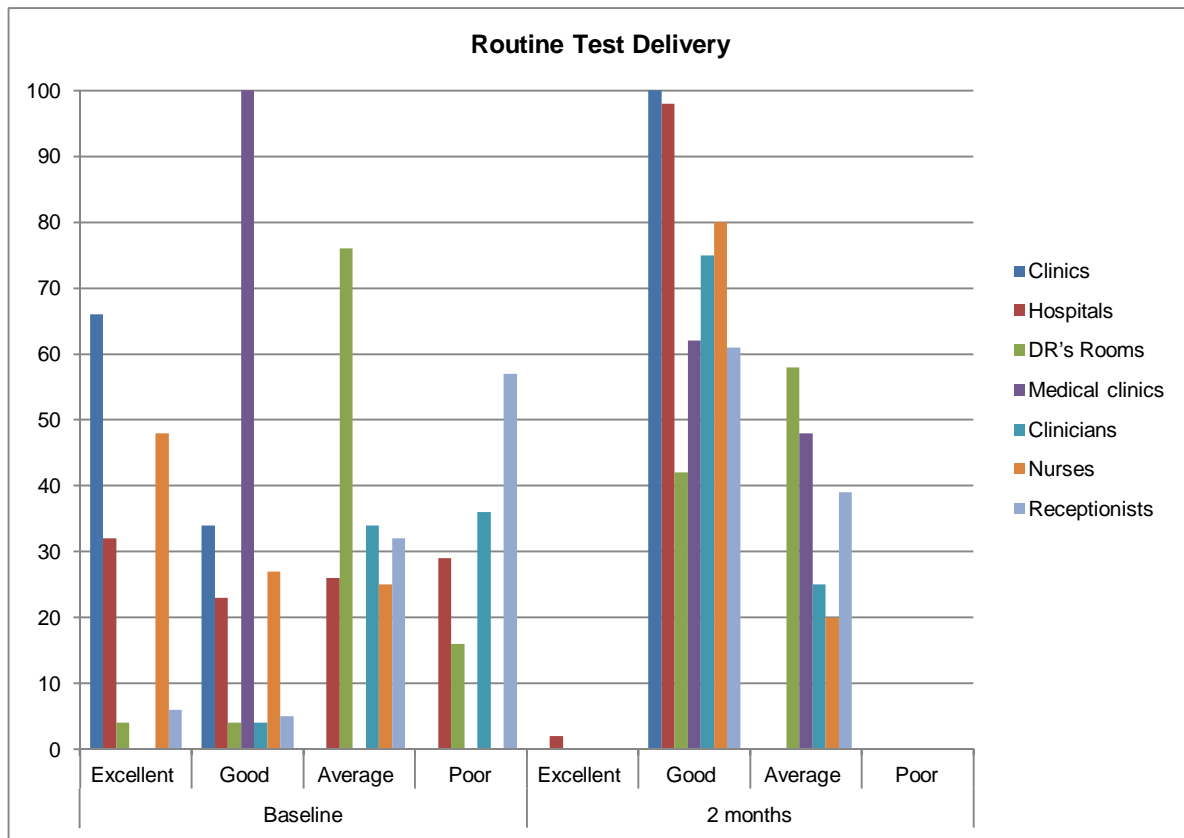
Figure 4.2 shows that at baseline 100% respondents from medical clinics were satisfied with turnaround times for urgent results. This might reflect that clients were satisfied or respondents might have answered questionnaires without truly airing their views because as Berte, (2007) suggests many people hate filling questionnaires. However if their responses were true, there was still room for improvement for Parkview Laboratory to delight their customers and ensure loyalty by improving service delivery of urgent results. After TQM intervention, improvements were noted, with 36% of total responses from the medical centres reflecting excellent turnaround times of urgent result and 40% good. However 24% respondents registered a decline in quality of urgent result delivery implying that turnaround times had increased instead of declining.

A root cause analysis was done as recommended by Erhabor and Adias, (2012) using the PDCA cycle and 5 WHY's, revealed that improvements resulted in increase in workload from the Medical centres. Parkview staff became overwhelmed with work without a complementary increase in staff, resulting in delays in turnaround of urgent results. Hence in preparing for accreditation, management should have structures in place to match scientist productivity with expected increase in workloads as well as adequate training. If hiring more staff is necessary during the period of TQM implementation, getting a pool of locums or contract workers might be wiser considering that when TQM is fully implemented use of lean systems and technology would increase efficiency complemented by lean staffing. It appears therefore that training of staff is the necessary solution to change management during TQM implementation. This is supported by Prajogo (2003).

Findings in Figure 4.2 also show that at baseline, 65% respondents from the clinics were receiving good service delivery of urgent results, while clinicians from doctor’s surgeries and their receptionists were unhappy as they registered average to poor service delivery of urgent results. After TQM intervention improvements were noted across the board as poor responses were eliminated but the percentages of clinicians, doctor’s rooms, and receptionists still in the average band is still worrying. This shows that the interventions did not fully address the root cause of the problem and as long as some of the clients from the different sites noted average service delivery of urgent results, they were dissatisfied and could easily defect and refer work to other laboratories. This is because quick delivery of laboratory results for patient management is of vital importance to clinicians- (Sunyog, 2004). Hence in Hospitals and medical centres, urgent results should be delivered within the shortest possible turnaround time- (Hasegawa and Karandagoda, 2011).

From Figure 4.2 however hospital staff registered average to excellent service delivery of urgent results at baseline. After TQM intervention average responses were eliminated, with only good to excellent services being noted. This shows that the interventions worked, though to varying degrees. As Parkview systems improve through TQM they are bound to improve service delivery of urgent results.

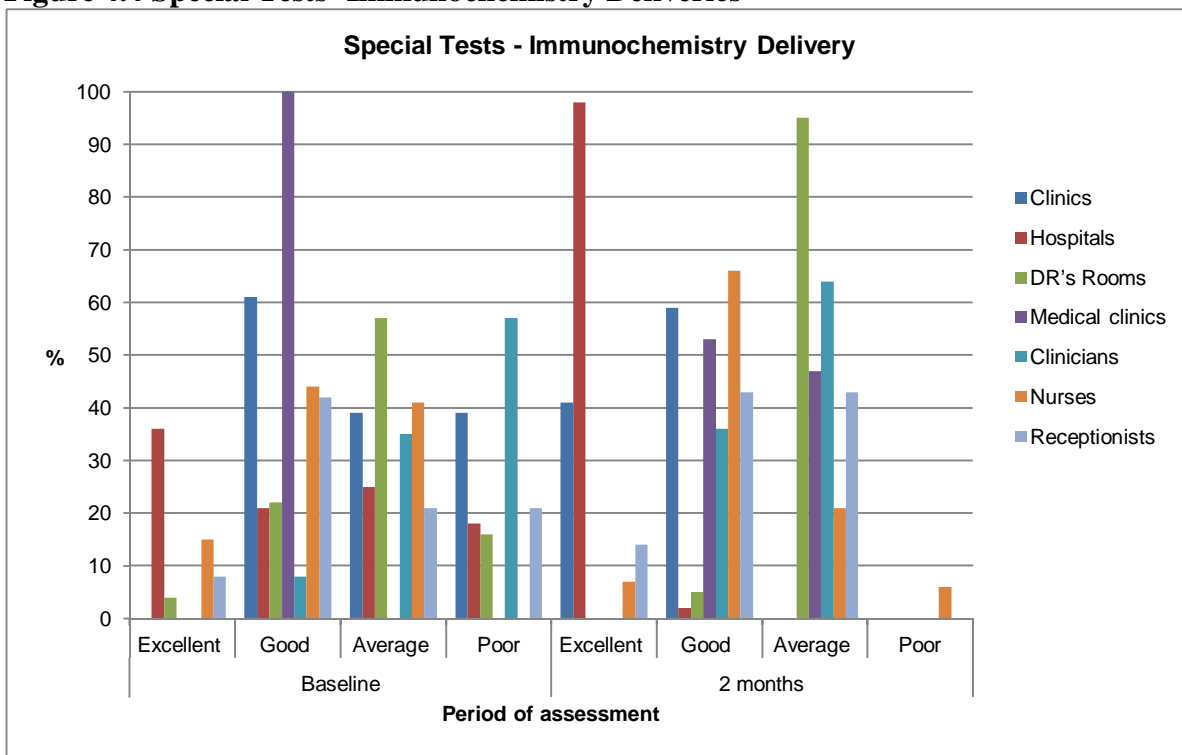
Figure 4. 3 Routine Test Service Deliveries



From Figure 4.3 it can be noted that poor service delivery of routine test results was eliminated after TQM intervention for all sites and professions, as compared to baseline findings. Though average responses were still noted by doctor’s rooms, clinicians and nurses, the percentage of complaints were less than at baseline. Notable was the decrease in complaints by doctors whose average- band response fell from 76% to 58% while the good band increased from less than 10% to about 42%, implying that most of the doctors noted an improvement in delivery of routine results after the intervention and could become satisfied customers if TQM efforts continued to increase to excellent levels of service delivery. Receptionists and nurses however were still dissatisfied with the service. It is interesting to note that the clients who noted excellent service of routine results now rated the services as good, implying that service delivery had deteriorated instead of improving. However this is in line with every change management programme, where current systems are being unfrozen to pave way for more efficient systems. As Moughazy, (2005) suggests this trend might only be temporary due to factors like, increased workload from implementation of TQM systems on top of daily work processes, insufficient experience or training of staff on TQM principles.

Figure 4.3 also shows that after intervention, almost 100% of the hospitals and clinics were happy with routine result delivery, though this should be improved to excellent service delivery. 80% of the nurses, 74% of the clinicians, 64% of medical centres and 62% of the receptionists were also happy. Hence given time and training, Parkview routine service delivery is set to improve if TQM systems continue to improve. This is because the six sigma, Kaizen and lean management principles show small incremental positive results whose benefits are reaped over time. (Erhabor and Adias, (2012:55-78); Burtis, (2002) and Korning, (2006).

Figure 4.4 Special Tests- Immunochemistry Deliveries



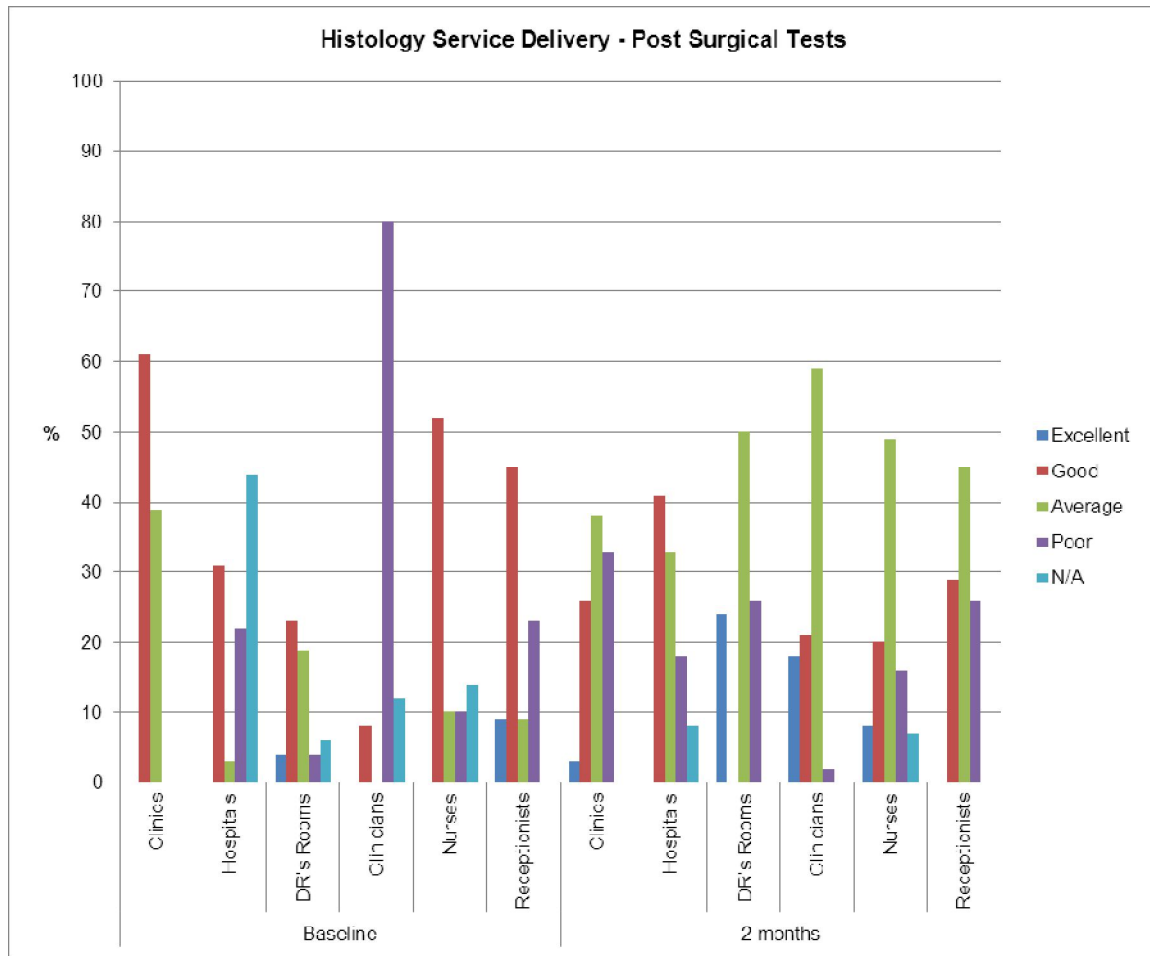
According to Figure 4.4, hospitals noted massive improvements in service delivery of immunochemistry special tests after intervention from 36% to 98% claiming excellent service delivery. Clinics also noted improvement as the excellent band grew from zero to 40% and the rest noting good delivery of these special tests. On the poor responses from all clients, noted at baseline, were eliminated except for a few nurses who still witnessed poor services. Most of the nurses (66%) and clinicians (36%) and 42% of the receptionists acknowledged improvements in the good band. Doctor's rooms, clinicians, clinics and receptionists however need special attention if their challenges are to be effectively addressed as they continue to rate the services average showing great dissatisfaction. From Figure 4.4 nurses also show mixed feelings with fewer nurses noting excellent services than at baseline and though improvements seem to be noted, most nurses still rate the service delivery of Immunology results as poor to good. More need to be done by Parkview management to improve this challenge.

Upon investigation using the PDCA cycle for root cause analysis (Erhabor and Adias, 2012; Shakya, 2010), it was noted that the root cause of the problem was that Parkview had no Immunochemistry machine at baseline and was sub-contracting samples. However the lab acquired equipment during the time of research to enable small improvements which were noted. Hospitals, who claimed receiving excellent services often, did not need to follow up these results because clients' results were forwarded directly to doctors' rooms by the Laboratory to enable patient review after being discharged from the hospital. The average rate of patients stay in hospital was three to four days meaning that doctors' rooms and clinicians were the clients who needed Immunochemistry the compared to hospitals.

On further investigation it was noted that clinicians from doctor's rooms, hospitals and medical centres were sending large volumes of requests for these special tests as compared to those requested by clinics. As such they noted a lot of delays in requested results which was due to sub-contraction of these tests to another laboratory. The nurses noted an improvement from average service delivery to good after the TQM intervention. The receptionists also reported improvements from poor service at baseline to good and even excellent services after improvements in equipment management and reagent acquisition.

Intervention addressed equipment and inventory management according to SLIPTA framework to equip the laboratory with required tools of trade and reagents to reduce referrals- (Berte, 2007 and Shakya, 2012). Management after doing a cost benefit analysis realised that the purchase of Immunochemistry and viral load equipment had long-term benefits to help win customer confidence and trust even though the purchase of this equipment seemed expensive at first. Not much change was noted after the first review as samples were still being referred, but after purchasing the equipment improvements were noted for all clients. It remains a challenge however for the firm to maintain the correct stock levels to match the demand by their clients which continued to increase as a positive response was being noted.

Figure 4.5 Histology Service Delivery- (Post Surgical Tests)

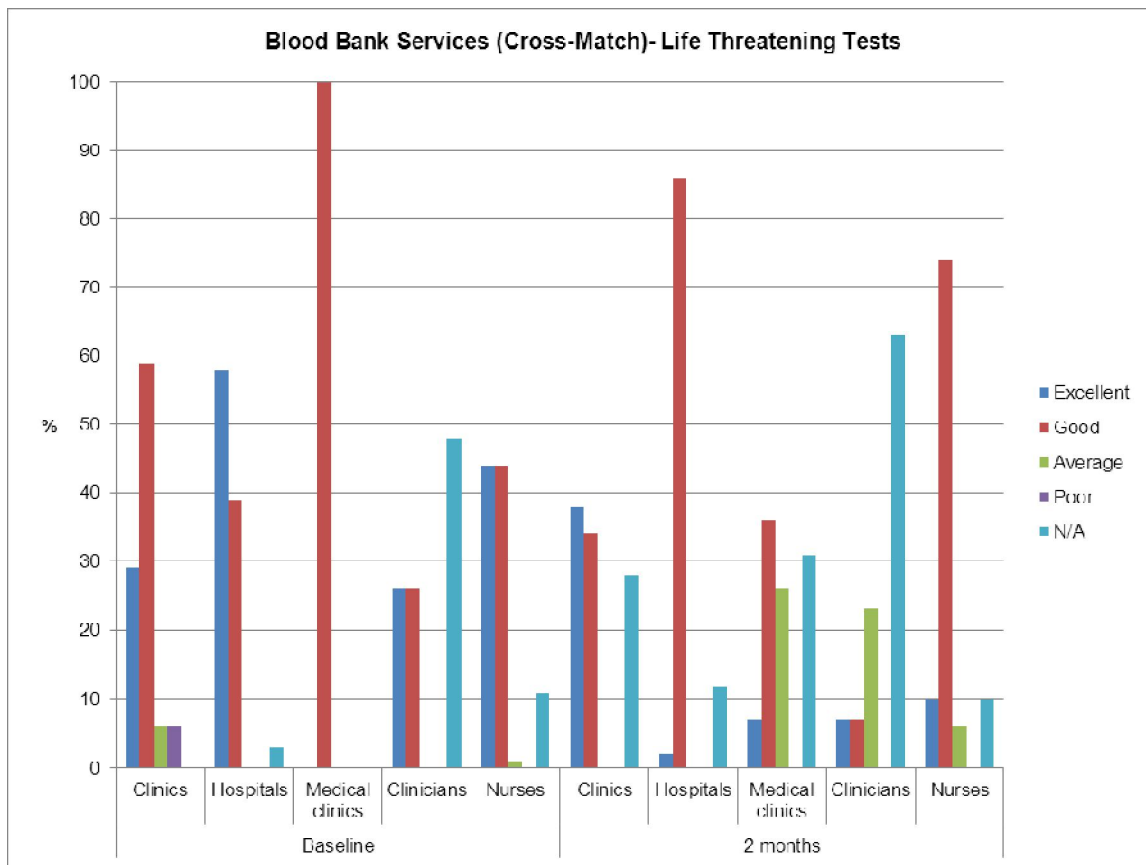


Findings from Figure 4.5 show that 80% of the clinicians, 22% of hospitals, 24% of the receptionists complained of poor Histology results turnaround times at baseline while 62% of clinics, 52% of nurses and 44% of the receptionists rated the service good. The rest rated histology services average though some indicated they did not require the service. Findings mean there was need for improving histology services to increase customer confidence and satisfaction in the firm. Parkview had histology turnaround times of two to four weeks while that of competitors were as little as three days. Figure 4.5 implies that after intervention service to clinicians improved. The poor band decreased while good service ratings increased. Clinics, nurses, receptionists and doctor’s rooms however complained of deteriorated services.

On further investigations through audits as recommended by Burtis, (2002) it was discovered that the Histology laboratory was a new department still being set up. Hence work processes, inventory and equipment management were in the process of being established and much training was needed to achieve quality management. As a way of intervention, the quality assurance manager was assigned to assist through audits, training and introduction of the 5 s

Kaizen and lean management principles to ensure stepwise improvements were achieved. After improvements, the positive changes noted by the clients resulted in increased sample volumes creating new challenges such as stock outs, and unpreparedness of the Histology staff to meet the increase in demand. The department changed location to move nearer to its clients to increase efficiency, thus showing commitment by management to the total quality management programme to improve their laboratory services. This is one of the critical success factors of total quality management as recommended by Talib (2005).

Figure 4.6 Blood Bank Services (Critical Life Saving Tests)



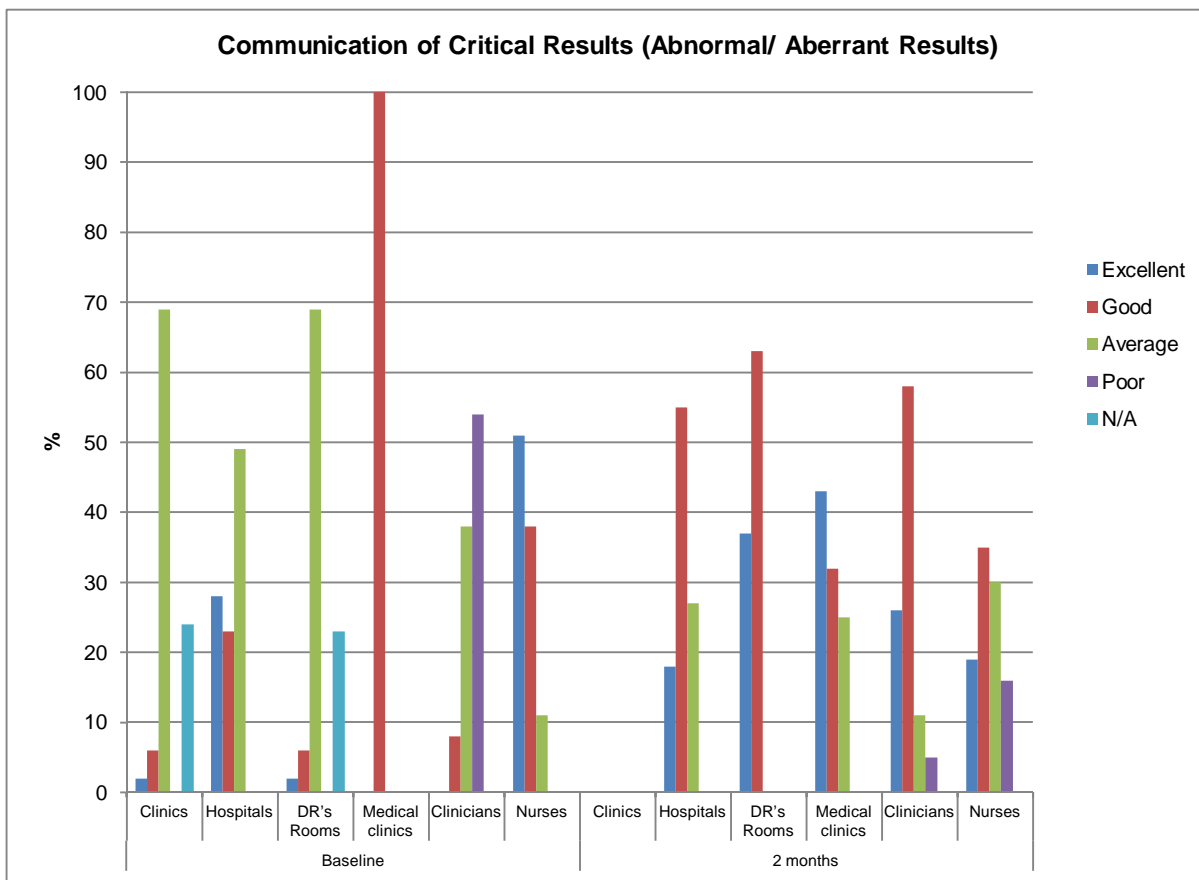
Cross-match services are critical life determining tests. The ability of a laboratory to offer these tests can save lives. Errors during blood testing or delay in turnaround time can result in death of patients due to transfusion of wrong blood products or before they receive the blood products. It therefore measures the technical abilities of laboratory staff as well as the efficiency of a laboratory during both day and night shifts as these tests are done 24hr a day and mostly by emergency hospitals, intensive care units, surgeons in theatre post surgery,

antenatal complications and other special cases. Results from Figure 4.6 show that clinics were happy with 59% rating good service and 29% rating the service excellent showing satisfied clients. Few rated it poor at baseline, but results improved to good and excellent response after the intervention. A few respondents did not require this service.

On average the nurses and hospital staff reported good to excellent services and noted improvements after intervention. About 48% of the clinicians however were unhappy at first but these noted improvements especially after the second month with 74% noting good service and 10% noting excellent service. Erhabor, (2012) suggests such improvements are a result of the six sigma quality control proving that quality assurance is a necessity in improving result accuracy and dependability.

Customer Care Issues

Figure 4.7 Communications of Critical Results (Abnormal/ Aberrant Results)

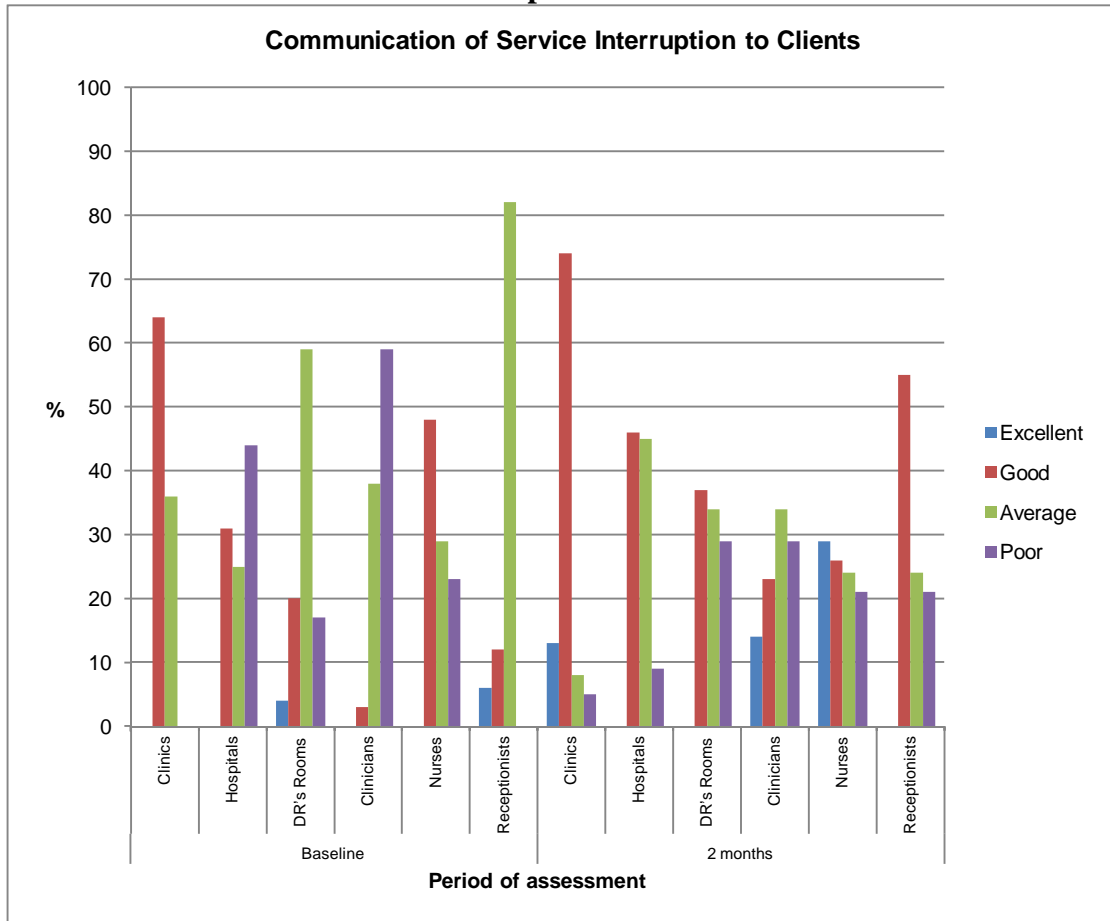


From Figure 4.7 at baseline, only medical centres and some hospital staff seemed to be receiving good services. Clinics, hospitals, doctors’ surgeries and clinicians were experiencing poor to average services showing customer dissatisfaction.

Parkview Laboratory was failing to communicate critical results within expected times. This improved after intervention as noted by the decrease in percentages of those who rated the services average to poor and increase in those who acknowledged good to excellent communication. There is still much room for improvement though, as most clients across the board, rated the services good instead of excellent, showing that though clients noted an improvement they were still only satisfied but needed to be delighted by the service if they were to remain loyal to Parkview

Laboratory. The Laboratory needs to increase efforts to quickly resolve its challenges and deliver critical results urgently to avoid loss of lives.

Figure 4.8 Communication of Service Interruption to Clients

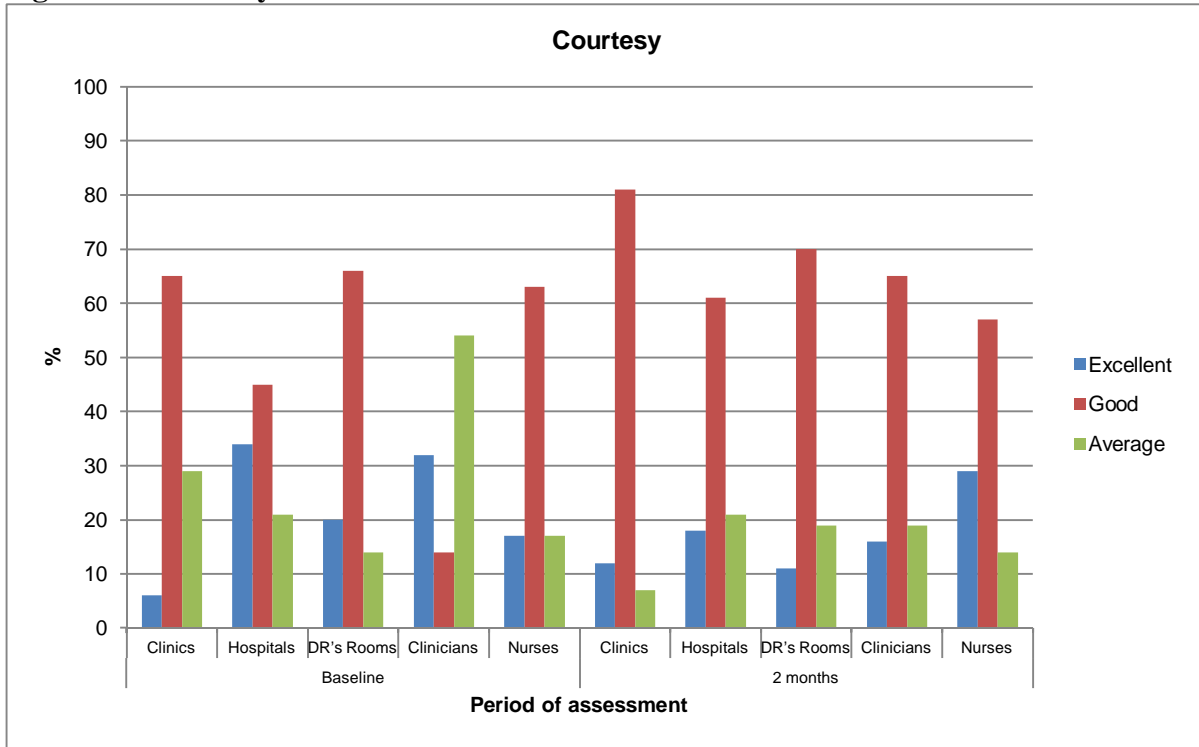


From Figure 4.8 though clinics and nurses were receiving good communication with Parkview Laboratory on service interruptions at baseline, other clients were complaining with the clinicians and hospitals citing poor to average communication. Little improvement was noted across the board as noted by recording of excellent service by some clinicians, clinics and nurses. Communication with clinics showed the most improvement followed by receptionists and hospital staff. Clinicians and surgeries also noted a reduction in poor to average responses and an increase in good to excellent responses showing that communication had improved after intervention but needed continuous improvement.

From Figure 4.8 results imply that Parkview Laboratory has been neglecting to inform its clients of in-house challenges that affect patient management. This was wrong as it seemed the firm was keener to protect its image by withholding information on service interruptions due to stock outs, equipment breakdown and challenges with referrals. Instead of advising the clients in time as recommended by accreditation standards, so that client could seek alternative service providers, the laboratory only informed those who would have asked for results. Customers were dissatisfied and felt they should have been given a choice to contract other service

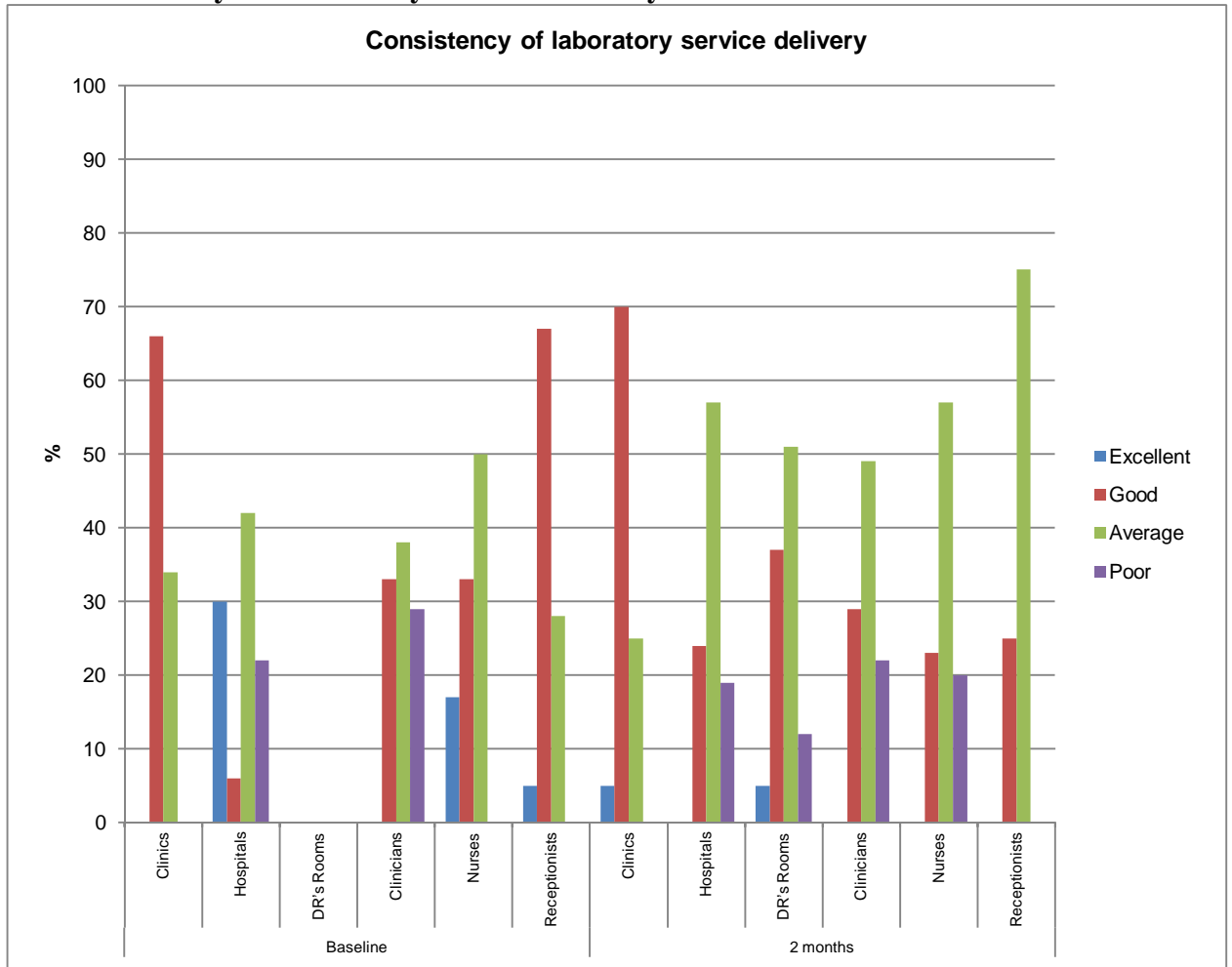
providers who could provide quicker service delivery, despite higher service charges. From this it was noted that clients always want to maximise their choice of service providers- (Berte, 2007). Hence management is urged to establish clear policies on communication of information to its customers to attain customer satisfaction.

Figure 4.9 Courtesy



Findings in Figure 4.9 show that most clients and sites were happy with the courteous behaviour shown by Parkview Laboratory staff on the phone or face to face. Courtesy improved after TQM interventions, despite an increase in the number of respondents showing that the firm's employees had been well trained in customer care. According to Lovelock, (2011) courtesy is a valued attribute in service delivery and sets a good foundation for TQM implementation as it ensures customer retention. Improvement in courtesy could enable customer recovery of the dissatisfied customers who might have defected due to other issues.

Figure 4.10 Consistency of Laboratory Services Delivery

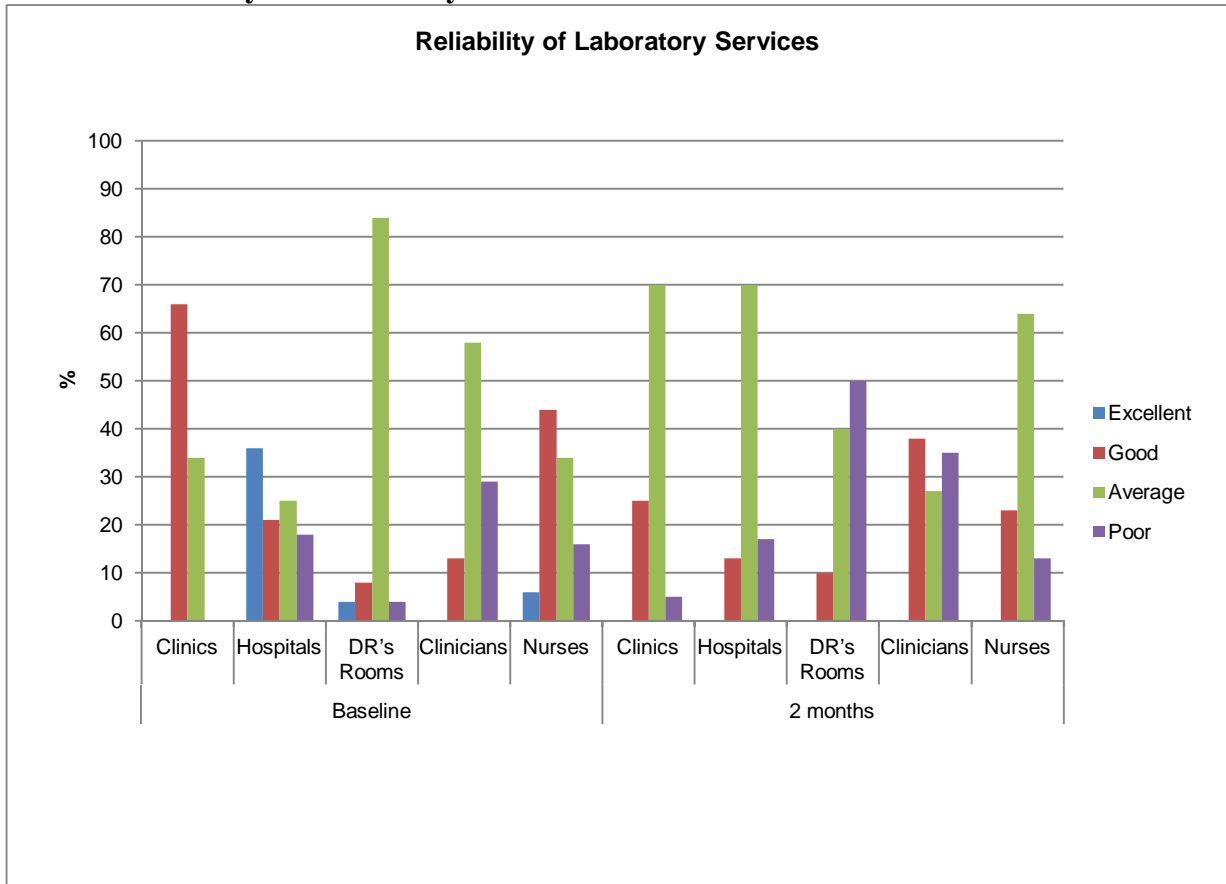


From Figure 4.10, Clinicians, some hospital staff and nurses were dissatisfied with the inconsistency of laboratory services both at baseline and after intervention as noted by the average to poor responses. Average ratings of service seemed to increase across the board showing little improvements after intervention. 68% of clinic staff and receptionists seemed happy with consistent service delivery from the laboratory. This might be because the type of clients who visit clinics might not require a lot of laboratory services resulting in fewer volumes of work from clinics as compared to those from hospitals and medical centres.

Also clinical conditions of clients from clinics are usually not critical as compared to the latter that depend totally on laboratory results for patient management.

Hence hospital staff and medical centres are more likely to note inconsistency and unreliability of laboratory services than clinics. Upon investigation the root cause of inconsistent services was reagent stock outs due to poor planning. Parkview Laboratory was growing but failing to consolidate its growth requirements with demand for services. As a result the provisions of special tests like Allergies, viral load and T-Cell was inconsistent. Resolving supply chain management systems at Parkview Laboratory might resolve challenges.

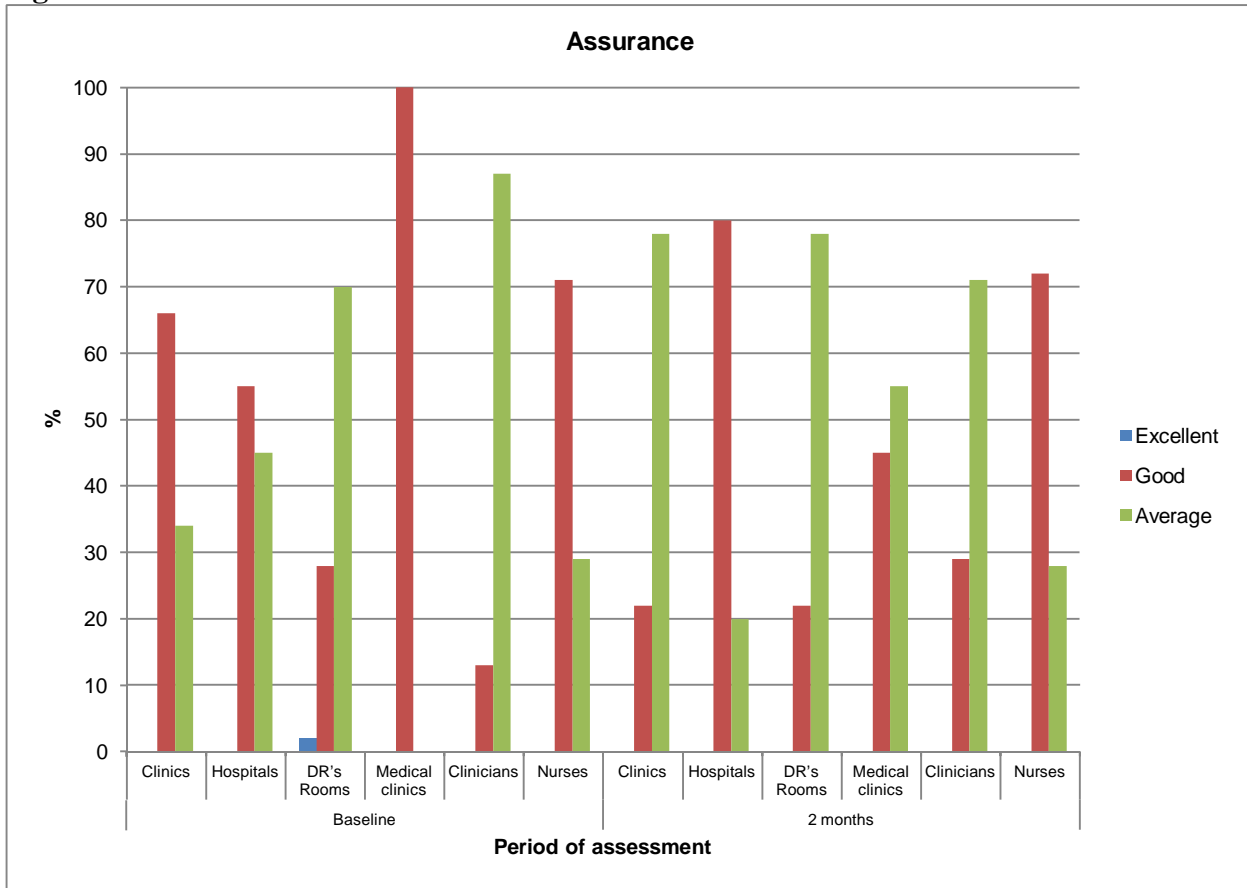
Figure 4.11 Reliability of Laboratory Services



From Figure 4.11 all customers especially clinicians and Doctor's rooms cited average to poor reliability of services and were dissatisfied with the unreliable service delivery both at baseline and after intervention, showing that not much improvement occurred even after TQM interventions.

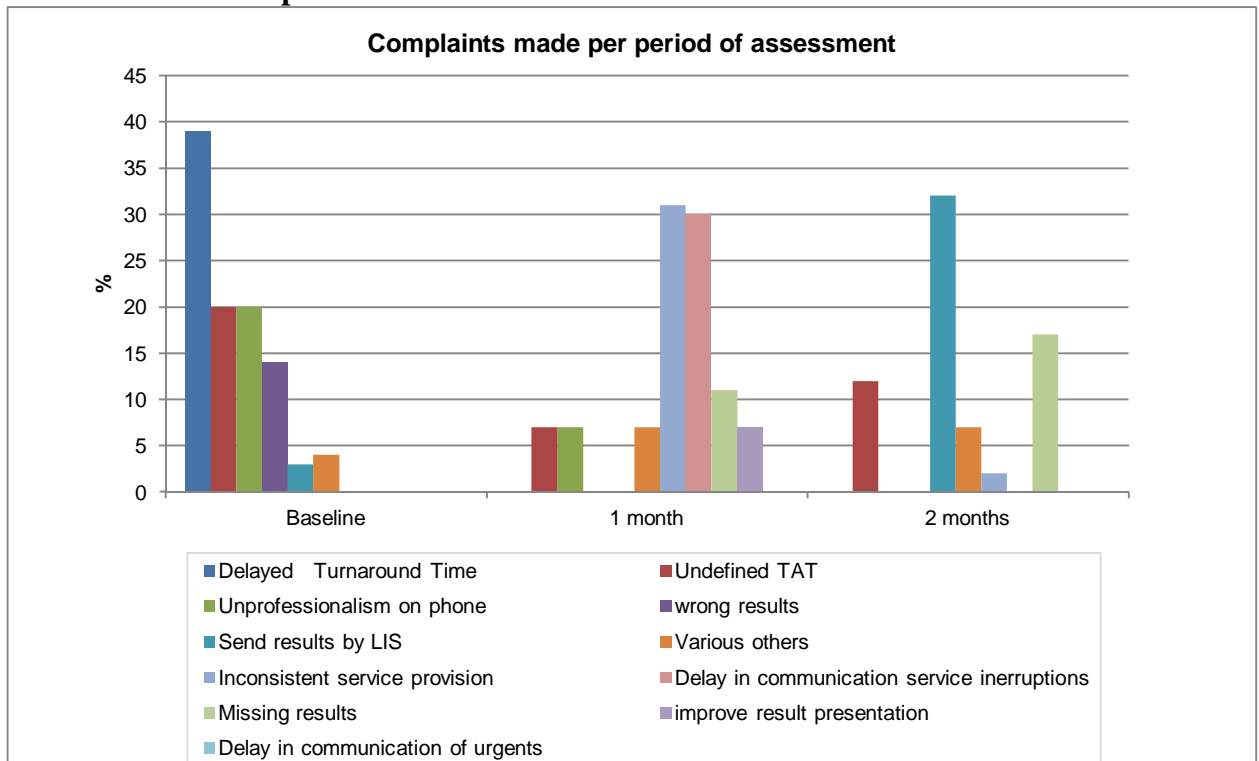
Root cause analysis using PDCA cycle and 5 WHY's showed the cause as poor value chain management. Regular reagent stock outs and lack of equipment to do special tests leading to referrals and subcontracting caused irregular service delivery. Subcontracting resulted in the laboratory losing control over turnaround times or the quality of results. Sometimes sample loss occurred, inconveniencing patients who had to be re-bled. Worst case scenarios resulted in some clients up being referred to other Laboratories for the same service, after having waited for results for more than two weeks. Such conduct caused delay in patient treatment.

Figure 4.12 Assurance



From Figure 4.12 Clinicians’ perceptions of Parkview laboratory’s credibility and reputation improved slightly as noted by increase in good responses from 12% to 28% and reduction in average responses from 86% to 71%. Nurses’ responses did not change implying either in lack of improvement of failure by nurses to give true responses to questionnaires. Hospitals noted improved good responses but are still not very satisfied. Clinics and Doctor’s rooms however seemed unhappy even after intervention as noted by increase in average responses meaning that Parkview was failing to address their issues to their satisfaction. As such Clinicians at surgeries and hospitals had little confidence in the service provision offered by Parkview laboratory.

Figure 4.13 Customer Complaints



From Figure 4.13, most complaints centred on turnaround time of results. The most prevalent complaint at baseline was delay in result delivery (39 %) followed by undefined turnaround times for special tests which were being subcontracted (20%), unprofessional conduct on the telephone by laboratory staff (20%) as well as wrong results noted by some clients (14%). From the same figure 4.13, the responses received after one month brought in totally new complaints such as failure by Parkview Laboratory to communicate service interruptions (30%) and as well as inconsistent service delivery (31%). Doctors’ rooms also complained of missing results (17%) resulting in delay in patient treatment.

The percentage of complaints about missing results seemed to increase instead of reducing (from 11% to 17% after second month), showing that this challenge had not been effectively addressed. However it’s possible that there was an increase in respondents from the same centre citing same challenge in the second month as opposed to an increase of gravity of the situation. Other complaints might have been resolved or complainants did not mention them again hoping they were being attended to. According to Lovelock, (2012) clients feel better when they know their complaint is being addressed or has been taken into consideration as seen by quick resolution of complaints. Hence all complaints need to be addressed effectively no matter how minor, if the firm hopes to attain a good reputation with its clients.

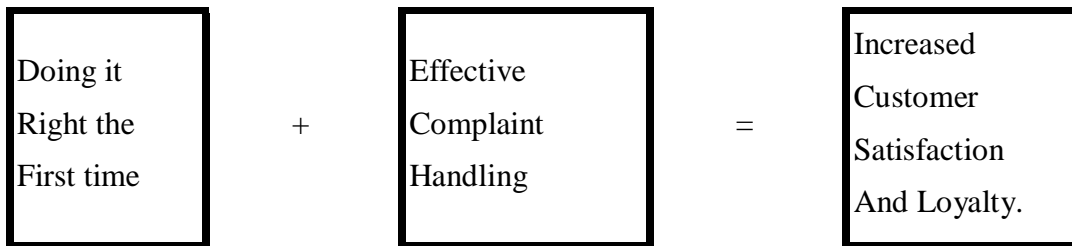
4.4.1 Discussion on Customer Satisfaction

Table 4.3 Summary of Customer Satisfaction

Interpreting levels of customer satisfaction		
Response	Description	Interpretation
Excellent	Completely satisfied	Very loyal
Good	Satisfied	Easily switch to a competitor
Average and Below	Dissatisfied	Very disloyal

According to Lovelock, (2004), the 80/20 principle implies that companies could improve profits by at least 25% just by reducing customer defection by 5% through delivering superior value to win customer loyalty. From Table 4.3 above, managers must be concerned if the majority of their customers fall into the satisfied group as because they can easily become dissatisfied with the services and defect, whereas dissatisfied customers as seen in Table 4.3 are very disloyal and have the danger of becoming terrorists who badmouth the company.

According to Lovelock, Patterson and Walker, (2004) customer satisfaction is linked not only to fault free service, but also to what transpires when something goes wrong. The first law of quality might be “do it right the first time”, but service failure does occur. According to Lovelock et al., the customer satisfaction formula is:



According to this theory Parkview Laboratory as an organisation which desires to become more competitive in a global environment should use surveys and clients complaints to create a customer database used for improvements and as a platform for identifying the customer’s thoughts, desires and needs in relation to its services. That having been noted, Moughazy, (2005) recommends that all complaints should be quickly resolved to show management commitment to delight the clients and also to seek ways to recover those clients who defect without lodging any complaints. From the complaints noted at Parkview, it is clear that there are gaps in service delivery at the laboratory. As noted by Lovelock and Wirtz (2007), when service gaps appear, clients are disappointed and not only defect but are more likely to bad- mouth the firm leading to defection of many other clients. However while a dissatisfied complainant tells nine other people, a satisfied customer tells half as many.

The fact that some clinicians have complaints ranging from delayed turnaround times, wrong results and poor communication between the laboratory and its customers, these clients end up having less assurance in the firm and are more likely to defect to other service providers and or

lead others to do so. Once the clinicians, receptionists and nurses cannot trust result accuracy, service reliability as seen by inconsistent service provision, they are more likely to defect by sending their patients to other laboratories.

Hence Parkview laboratory should aim to use total quality management systems to improve results quality as well as quality of delivery of all its services. As Moughazy, (2005) correctly says, while it is important to improve quick turnaround time, it is more important to eliminate all sources of error in the pre-analytical, analytical and post analytical phases of laboratory testing to ensure correct, accurate reliable result delivery. After achieving this using six sigma principles the laboratory should focus on increasing efficiency in laboratory processes as defined by lean management principles. Quick reliable delivery of accurate results to all clients should be the targeted goal when implementing total quality practices and as seen through this project, this can be achieved.

4.4.2 Service Gaps

According to the Parasuraman (1985) service gaps occur when customer expectations are not met and the delivered services do not match the customer's perspective leading to customer dissatisfaction. In the case of Parkview laboratories Table 4.4 summarizes the desired expected service versus the current experienced service.

Table	4.4	Gap	Analysis	Results
Client & Site	Customer Expectations	Dissatisfiers Identified in Service Delivery at Parkview Laboratories.	Gaps Identified	
Doctor's rooms Clinicians Receptionists Clinics	Accurate, reliable results delivered quickly and consistently.	Wrong results show that the firm is not delivering services at set standards.	Gap 3	
	Availability of all test panels onsite.	Inconsistent & unreliable services. Delayed & undefined turnaround times due to subcontracting, shows that firm is unable to match service delivery with its clients needs.	Gap 4	
	Good communication of urgent & critical results or interruption of services	Failure to communicate service interruptions shows lack of knowledge of the needs of its clients.	Gap 1	
Hospitals & Surgeons	In addition to the above, reliable Histology and Blood bank services to service life threatening cases and post	Service quality gap as seen by poor Histology services.	Gap 6	
	Error free diagnosis.	Wrong results.		
Nurses	Accurate, reliable results delivered quickly and consistently for consultation with clinician who may not be present on site where patient is. Good communication of urgent & critical results or interruption of services.	Delayed turnaround times. Erroneous results.	Gap 3	
	Availability of all requested test panels at laboratory with defined turnaround times for effective patient management.	Undefined turnaround time for special diagnostic tests necessary for decision making.	Gap 4	
Medical centres	Reliable delivery of all results so as not to inconvenience patients. 24Hour services Electronic communication of results (LIS)	Overpromising. Parkview laboratory is not matching performance of urgent & special tests to communicated promises.	Gap 4	
	Good communication of urgent & critical results or interruption of services for decision making.		Gap 3	

Conclusion

Result findings show gaps were present at Parkview laboratory especially at baseline, but implementation of TQM practices brought improvements to varying degrees depending on the attribute being tested. The SLIPTA model seems to be applicable in Zimbabwe as a tool for accreditation. Parkview management should do all it can to increase efficiency through TQM practices noted so as to create completely satisfied customers in all its clients, to ensure customer loyalty. This can only be achieved by maintaining continuous improvements in all management areas so as to ensure that the needs of clinicians, nurse and receptionists from all sites are met. From the presented findings, employing the TQM practices defined by the SLIPTA model this can be achieved.

CONCLUSIONS AND RECOMMENDATIONS

Introduction

This section presents findings from both secondary and primary research, leading to conclusions and subsequently recommendations of the study. It also points to areas of further research.

Findings from the Study

This study acted as a pilot project to assess the impact of introducing total quality management practices at Parkview Laboratory. This section presents secondary and primary findings against the key variables of research objectives.

Findings from the Literature Review

Results from review of literature found out that:

- SLIPTA as a total quality management tool is applicable to clinical laboratories and is effective in improving factors affecting process efficiency, (Damet, 2010: 1-8) and endorsed by WHO-AFRO ISO (15189).
- Integrating SLIPTA with Six sigma and lean management principles is effective in identifying the root cause of factors affecting processes, (Talib, Rahman and Qureshi, (201:155-160).
- In particular, six sigma, Kaizen and lean management principles were useful in improving error detection, correction and improvements in laboratory processes resulting in improved turnaround times, result accuracy and work area management-(Talib Rahman and Qureshi, 2010).
- The disadvantage of SLIPTA model however, seems to be the distribution of points for accreditation on the audit checklist which prioritises resource management at the expense of improvement management, which is critical for sustainable continual improvement. (Datema, 2012:363). As such, because SLIPTA model seems to base preparation for accreditation on the percentage of compliance to the checklist, the number of stars obtained might not necessarily match the type of quality attained by the laboratories.
- Gap analysis of services and customer satisfaction according to Parasuraman et al., (1988) provides a platform for identifying customer perspectives, needs and complaints so as to meet those needs and bring customer satisfaction.
- Gap1: Customers can get dissatisfied when there is a knowledge gap which occurs when there is difference between what they expect and what management thinks customers expect (Lovelock, 2011:408).

- Gap 2: Customers can get dissatisfied when there is a policy gap which occurs when there is difference between management's perspective of customer perceptions and the translation of these perceptions into service quality specifications (Bordley, 2009).
- Gap 3: Customers can get dissatisfied when service delivery does not match specified standards of service quality (Blog.vovici.com; 2009).
- Gap 4: Customers can get dissatisfied when there is a difference between a firm's communicated promise and failure by the firm to meet these promises in the customers' experience (SLIPTA JAICA; 2007).
- Gap 5: Customers can get dissatisfied when there is a mismatch between a customer's perception of the experience and their expectations (Lovelock, 2011).
- Integrating gap analysis with SLIPTA, six sigma and lean management can lead to improved customer satisfaction and subsequently competitive edge in the clinical laboratory services where there is stiff competition.
- As with all change management programmes, TQM is a continuous programme that requires time and will achieve incremental improvement (Erhabor and Adias, 2012).
- As such though this project spanned over three months, Parkview Laboratory's achievement of accreditation should not be a means to an end but should mark the beginning of a lifetime journey of continuous improvements because customer needs and healthcare trends change with time (Dos Santos, 2010).

Findings from the Primary Research

Applicability of SLIPTA as a TQM tool in clinical laboratories

- Findings in Table 4.1 and Figure 4.2 support that SLIPTA as a TQM tool is effective for stepwise continuous improvement in clinical laboratories. All laboratory processes noted improvement with the highest recorded in Internal Audit (82%); Client management (62.5%); Document and records (52%) and the least being in information management. Overall there was an average improvement of 31% across the board and from zero star level to two star level.
- Most processes in the studied locations (doctor's rooms, clinics, hospitals and medical clinics) recorded good to excellent ratings in the following:
 - Urgent test services
 - Routine test delivery
 - Blood bank services

This indicates that customers receiving services range from completely satisfied to satisfy but can easily defect to competitors.

- Integrating SLIPTA six sigma, Kaizen and lean management improves clinical services by improving error detection, correction and efficiency of laboratory processes resulting in improved turnaround times, result accuracy and work area management. This improved client confidence and assurance in Parkview's ability to provide desired service quality if given time. This is proof that adoption of TQM practices has the capacity to bring desired quality improvements necessary for business growth and profitability.
- SLIPTA model has the potential of improving clinical laboratory services in resource limited set ups especially when coupled with task based trainings and on bench coaching to empower staff and management.

- Staff buy-in proved a critical success factor as motivation of staff is very vital.
- The use of a checklist standardises and guides laboratories with clearly laid out requirements for accreditation for better preparation before the actual external audit.

Current Quality Practices at Parkview Laboratory

- Findings from Table 4.1 absence of internal audits (0/10 points) and poor points achieved at baseline, in document and records (4/25); management reviews (3/17); occurrence (4/12), incidence (4/12) and client management (2/8), imply that Parkview Laboratory at baseline did not have clear structured policies and principles for total quality management implementation. As such the customer survey revealed service gaps as a result of lack of quality planning and quality assurance principles. Laboratory services seem to be directly affected by the level of quality planning, quality assurance and implementation by management of quality policies, and supporting documents, systems and infrastructures that support implementation of these continuous improvements in a systematic and structured way.
- Value chain management in terms of continued financial support, high quality tools of trade, human resource empowerment through trainings or mentoring and staff motivation are vital to ensure sustainable quality service delivery. Regular internal and external audits appear necessary for sustainable quality management practices.

Gap Analysis of Parkview Laboratory Services

Customer survey results provided evidence that:

- Laboratory personnel's knowledge of customers' needs is different to what customers require of them as shown by 39% complaints on delayed turnaround time of urgent results and poor communication of service interruption (30%).
- Parkview laboratory fails to match specified quality standards as seen by delivery of wrong results (14%).
- Parkview laboratory tends to overpromise and fails to match its promises and service delivery as seen by sub-contraction of special tests resulting in inconsistent service delivery (31%) and undefined turnaround times (20%).
- There is service quality gap at Parkview as seen by poor Histology and special test delivery services (30- 39%) and missing results (17%).

As suggested by the gaps model, the gap analysis provided Parkview laboratory with insight regarding its customers' perceptions of service quality, giving management an opportunity to establish correct solutions to close these gaps through implementation of TQM practices. This should improve customer satisfaction instead of the current dissatisfaction.

Conclusions

The study concluded that:

- The SLIPTA model has proved to be applicable as a total quality management tool which can be used in Parkview Laboratory settings to prepare for and achieve accreditation as a way of improving the quality of its services. It is recommended to achieve quality improvements in all areas of management framework and operations.

- The SLIPTA model's success is linked to its ability to equip laboratory staff to take ownership over laboratory processes, systems and procedures so as to come up with solutions which improve the workplace through brainstorming and root cause analysis by self directed teams.
- Current laboratory practices at Parkview, lack alignment towards TQM or provision of quality services and should be improved by adopting quality policies and structures to ensure sustainable quality management practices resulting in customer satisfaction. Regular audits should be encouraged to create and maintain a quality culture.
- Failure to do regular gap analysis through customer surveys results in management failing to capture its customers' perceptions, needs and complaints, resulting in customer dissatisfaction and possibly defection. However through regular surveys, firms stay in touch with changing customer needs and can create a database for strategic planning and pro-active actions to meet customer needs resulting in customer satisfaction and loyalty.

Recommendations

The study recommends that:

- TQM implementation using SLIPTA model is recommended because it has a customer centred approach which provides a system of detecting customer service gaps. It also provides recommended solutions in a systematic and scientific manner which can be standardized and adopted in any laboratory (Scotchmer, 2007).
- The identified service gaps can be closed by active uptake of total quality management practices to improve processes, accuracy, and communication and information management in relation to identified customer needs (Dosantos, 2010).
- Complaint handling processes should be standardised to quickly and effectively address clients' needs to ensure customer satisfaction, to breed loyalty and recover defecting clients. As recommended by Lovelock (2007), customer relationship management and laboratory processes should improve at Parkview laboratory to match customer perceptions and needs. This is achievable if desired needs are known. Hence customer feedback platforms should be introduced.
- The desired end is to create loyal customers who become apostles of the firm, recommending its services by word of mouth, and being positive influencers (Lovelock and Wirtz, 2007). The service paradox theory also supports customer recovery actions to win back defected customers some of whom might have turned into terrorists who bad mouth the firm (Lovelock, 2011). By employing such quality practices, Parkview Laboratory can win back the trust of dissatisfied clinicians who might have defected, or intending to defect due to bad experiences like receiving wrong results or delayed turnaround times.
- The PDCA cycle is recommended to enable continual improvement of processes and systems, resulting in creation of standard operation procedures and policies that eliminate the root cause of errors, delays, unreliability and inconsistent service delivery. Documentation and record keeping of complaints, corrective and preventive actions should improve for each noted complaint.
- Management should match communicated promises to satisfy their customers and improve the company's reputation.
- The final goal is to achieve an efficient laboratory with minimal service interruption, offering accurate, dependable results quickly and reliably. To achieve this management

has to complement its efforts by supporting the human resource element through trainings and incentives for motivation, provide financial support, tools of trade and adequate inventory so as to avoid stock outs and referrals.

Areas for Further Research

- Achieving accreditation is not a destination but an on-going journey of continuous improvement which requires development of a quality culture. Parkview laboratory needs to conduct a needs analysis on its quality requirements and how to empower its staff to effectively implement quality systems.
- Parkview needs to develop a customer data-base to study their needs and develop a proactive approach of meeting its customers' needs.
- The cost-benefit analysis of TQM should be done and the savings to be achieved quantified.
- There is need to re-assess the needs of medical centres more effectively as data obtained from this place seemed to be biased or incorrectly collected. Defined turn-around times for Parkview Laboratory should be developed working hand in hand with its clients to ensure feasible turnaround times are agreed on which should be met. All logistics need to be put into consideration in coming up with these times.

Conclusion

The research project seems to have achieved its targeted goal of assessing the practicability of implementing the SLIPTA model for achieving accreditation, as well as identifying the factors affecting quality at Parkview Laboratory and identifying service quality gaps with a view of eliminating them. As noted by the results of the SLIPTA checklist audits and customer surveys, these improvements in turn are expected to improve customer satisfaction resulting in profitability related to high quality service delivery. Accreditation as a seal for the laboratory's ability to produce highly reliable services and accurate dependable results that meet global standards would not only be a marketing tool for Parkview Laboratory, but would also ensure error free diagnosis for the laboratory's clients. Hence the impact of implementing total quality management practices is improvement in customer satisfaction at all sites resulting in sustainable competitive advantage to Parkview Laboratory in a tough economic environment.

NOTE:

This paper was extracted and compiled for journal publication by editing the manuscript that was presented as a dissertation to the Regent Business School, Durban, South Africa, by the principal author in partial fulfilment for the award of the Masters Degree in Business Administration (MBA) in the year 2013.

The dissertation was supervised by Edith Chimusoro, who is attached to the School as an external supervisor and examiner.

The manuscript was edited and assembled for journal publication by Professor Anis Mahomed Karodia, Senior Academic and Researcher, Regent Business School, Durban, South Africa.

Kindly note that the entire bibliography that was cited for the dissertation is provided and the references used in the article are contained within the full bibliography cited.

If a copy of the entire study is required a full motivation must be made to the following Email address, stating the reasons, as to why the full study is required. Email to: akarodia@regent.ac.za

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