

Barriers To Implementation of Quality Management Systems (Qms), of Accredited Public Health Laboratories, In Botswana

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Abstract

The purpose of this study is to identify factors that hinders the implementation of Quality Management Systems(QMS)in selected Public Health Laboratories. The study population was from the targeted seven accredited Public Health Laboratories in Botswana. Data on critical success factors and their respective elements was collected using a questionnaire. The questions were based on the critical success factors for implementation of total quality management identified during the literature review. Ten Critical Success Factors were rated by a group of questions using a five point Likert scale method. Strongly agree was assigned a score of 5, agree is assigned a score of 4, neutral is assigned a score of 3, disagree is assigned a score of 2 and strongly disagree a score of 1. The mean of the assigned ratings is 3.0. Critical success factors which score mean greater than 3.0 will be classified as agree while those mean less than 3.0 will be classified as disagree. All the ten success factors were deemed critical but four of the critical factors had elements that were regarded as barriers to QMS implementation. The ten critical success factors identified were;Employee empowerment Strategic quality planning, Process management, Performance management, Quality culture, Management and leadership, Training, Supplier Management, Customer focus and Information analysis. On the contrary, four critical success factors had elements that scored less than 3.5 mean, so the elements were regarded as barriers to QMS implementation; Effective communication between management and employees, Staff compensation not linked to achieving quality goals, Employees are rewarded for their performance and Employees not taking part in evaluating suppliers.

Keywords: *Accreditation, Critical Success Factors, Likert Scale and Barriers, Mean, Public Health Laboratory, Questionnaire, Quality Management System.*

Introduction

Botswana is a landlocked country in Southern Africa, which shares the border with Zambia, Namibia, Zimbabwe and South Africa. It has an area of 582,000 sq km, with a population of about 2, 2 million people. The country is sparsely populated because up to 70% of the country is covered by the Kalahari Desert [1]. The economy is mainly sustained by tourism, mining and agriculture. The country got independence on the 30th September 1966 and has a multiparty constitutional Democracy [2].

It has a total of 54 Public Health Laboratories which are all under the Botswana Ministry of Health.

Botswana in its endeavors to improve the health and safety of its nation, in 2005 it embarked on accreditation for its health care facilities. Hospitals were to be accredited under the Council for Health Service Accreditation of Southern Africa (COHSASA) programme and medical laboratories under the ISO 15189:2010 [3]. Support was provided through training and mentorship program. Despite all the efforts, only seven laboratories

out of fifty-four (13%) achieved accreditation as of May 2021 [4].

The objective of the study is to identify elements of the critical success factors which were not adequately deployed resulting in them becoming barriers to successful implementation of QMS and attainment of international accreditation.

Research Methodology

This is a study which uses both qualitative and quantitative data. The critical success factors were identified from the literature review. [5]. The data collection tool was adopted from the literature review [6]. The factors with a mean of 3.0 were classified as critical. So, since these factors have been identified and used elsewhere by different researchers, their reliability is confirmed [7]. The tool uses several questions to identify deployment of the ten critical success factors. The quantitative methodology, which used the ordinal scale of measurement, was chosen to allow the researcher to analyze data using statistical tools that would have been impossible with qualitative methods [8].

Sample Size Determination

The study population was from the targeted seven accredited Public Health Laboratories in Botswana. A study sample of participants was randomly selected to include participants from each category of employees within the organization to complete the questionnaire. The researcher requested contact details of staff in the seven laboratories and put into separate boxes then performs stratified sampling by randomly picking eight participants from each box.

Data Collection

Data on critical success factors was collected using a questionnaire. The first part of the survey used a 5-point Likert style to determine the level of agreement or disagreement among survey participants with elements of the critical success factors. The 5-point Likert

scale includes the items: *strongly agree*, *agree*, *neutral*, *disagree*, and *strongly disagree* [9]. Using this type of scale allows participants to choose how strongly they agree or disagree with elements of the ten critical success factors. *Strongly agree* was assigned a score of 5, *agree* is assigned a score of 4, *neutral* is assigned a score of 3, *disagree* is assigned a score of 2 and *strongly disagree* a score of 1 [9]. The mean of the assigned ratings is 3.0. Critical success factors which score mean greater than 3.0 will be classified as *agree* while those mean less than 3.0 will be classified as *disagree* [10]. The study did not seek to establish causation but intended to identify practices that are common with Public Health laboratories that have achieved accreditation in Botswana. The questionnaire for the quantitative part of the study was sent to participants/respondents through email or courier services. Participants were assured of confidentiality of their responses. The completed survey was sent to the researcher through email or hand delivery. The participants returned the questionnaire within a period of two weeks.

Data Analysis

A study questionnaire developed by the researcher was used in this study. Participants were asked to rate the level of agreement or disagreement with the different statement using a five-point scale Likert method [11]. The data analysis was done using Microsoft Excel 2007 or SPSS. The mean for the responses for each factor will be computed and returns with mean greater than 3.0 were classified as critical successful factors for Botswana Public Health laboratories. Those factors that score mean of less than 3.0 were classified as not critical.

Results (Findings)

Responses from participants were analyzed for each critical success factor. For each element, a mean score was computed and

returns with mean greater than 3.0 were classified as critical while those factors that score mean of less than 3.0 were classified as not critical. The mean score of each element was used to indicate performance on each element. Mean scores of less than 3.0 meant poor performances (barriers) on a particular element while those greater than 3.0 meant good performance (enablers).

Table 1 summarizes the average mean of the ten critical success factors that were assessed by the participants. Staff empowerment had the highest mean of 4.77 while information analysis had the lowest mean of 3.77.

Leadership And Management

A total of six questions were used to investigate management and leadership commitment as a critical success factor for implementing total quality management. The elements included the ability of management

to mobilize employees towards achievement of goals and objectives of the organization, effective communication, provision of resources, management commitment, and development of quality management system documents and coaching of employees to achieve their objectives.

Respondents generally agree that top management can mobilize employees towards achievement of laboratory goals and objectives. The mean score 3.970 and CV = 0.178 suggest there is small variability in this opinion. Respondents were neutral to the statement that there is effective communication between top management and employees. The mean 3.240 and corresponding CV = 0.264 suggest there is small variability in this opinion amongst the respondents.

Table 1. Average responses of the seven accredited laboratories in Botswana in relation to the ten critical success factors, in 2021.

Number	Critical Factors	Average Mean	Average Coefficient of Variant (Cv)
1.	Employee empowerment	4.77	0.193
2.	Strategic quality planning	4.74	0.151
3.	Process management	4.49	0.130
4.	Performance management	4.23	0.311
5.	Quality culture	4.20	0.120
6.	Management and leadership	3.97	0.245
7.	Training	3.94	0.121
8.	Supplier management	3.83	0.190
9.	Customer focus	3.77	0.163
10.	Information analysis	3.57	0.224

Table 2. Average Responses of The Seven Accredited Laboratories in Botswana, in Relation to the Six Elements Assessed, Under Management and Leadership, By the Year 2021.

Statement	MEAN	Standard Deviation	Coefficient Of Variation (Cv)	Majority Opinion
Top management is able to mobilize employees towards achievement of laboratory goals and objectives.	3.970	0.707	0.178	Agree
There is effective communication between top management and employees.	3.240	0.855	0.264	Neutral
Top management is committed to and supports quality management activities.	3.800	0.901	0.237	Agree
Top management has developed necessary quality management system documents.	3.860	0.974	0.252	Agree
Top management coaches and assists employees to improve their performance.	3.63	1.060	0.292	Agree
Top management provides resources needed to perform quality management activities.	3.800	0.933	0.246	Agree

Respondents generally agree that top management can mobilize employees towards achievement of laboratory goals and objectives.

Employee Empowerment

Investigations under this critical success factor targeted deployment of ten elements. Participants agreed that nine of the ten elements investigated were deployed as shown on table 2.

The respondents mostly agreed to given statements. However, they strongly agreed that as employees, they were involved in developing standard operating procedures.

This item has a mean score of 4.77 with a CV of 0.089 which indicates that there is a small variability in the responses. The respondents were neutral to the statement that says employees are recognized or rewarded for their performance, which then makes this element a barrier to quality implementation [10]. This had a mean score and CV of 3.000 and 0.370 respectively. There was also a general agreement to the statement that management recognizes employee performance on quality with a mean score of 3.710 and CV of 0.191.

Table 3. Average Responses of The Seven Botswana Accredited Laboratories in Relation to the Ten Assessed Elements, Under Employee Empowerment, In 2021.

Statement	Mean	Standard Deviation	Coefficient Of Variation (Cv)	Majority Opinion
As employees, we were involved in developing standard operating procedures.	4.770	0.426	0.089	Strongly agree
At the Laboratory, there is democratic/participative management.	3.800	0.759	0.200	Agree
Employees are encouraged to provide suggestions to management.	4.030	0.747	0.185	Agree
Management uses a non-punitive approach to nonconformities	4.460	0.611	0.137	Agree
Employees are recognized or rewarded for their performance.	3.000	1.111	0.370	Neutral
Employees are encouraged to control, manage and improve processes within their area of responsibility.	4.000	0.728	0.182	Agree
Management recognizes teamwork within the laboratory.	3.690	0.758	0.205	Agree
Human resource practice is aligned to the laboratory strategy.	4.090	0.981	0.240	Agree

Employees have well developed roles and responsibilities.	4.060	0.591	0.146	Agree
Management recognizes employee performance on quality	3.710	0.710	0.191	Agree

For the employee empowerment element, the respondents mostly agreed to given statements. However, they strongly agreed that as employees, they were involved in developing standard operating procedures.

Supplier Management

A total of six questions were used to supplier management. Participants agreed that four of the elements investigated while the other elements were not. The four elements that were deployed include provision of specifications for critical supplies, inspection and testing of incoming goods, existence of effective inventory management procedures and offering technical assistance to the procurement. For the supplier management element, the respondents generally agreed to

most of the items that were stated. However, they were neutral to the statement that the laboratory staff members participate in the evaluation of suppliers with a mean and CV score of 3.260 and 0.097 respectively. The respondents agreed that the laboratory provides technical assistance to the procurement unit on issues related to the laboratory with a mean value of 3.770 and CV score of 0.214. All CV values were relatively small which indicated that there was a small variability in the responses of the individuals. The element on participation of selection of suppliers was not deployed, so it is a barrier to the implementation of Quality Management System in the Public Health Laboratories in Botswana [12].

Table 4. Average Responses of The Seven Accredited Laboratories in Botswana Regarding the Six Elements Assessed Under Supplier Management, in 2021.

Statement	Mean	Standard Deviation	Coefficient Of Variation (Cv)	Majority Opinion
The Laboratory staff members participate in the evaluation of suppliers.	3.260	1.010	0.310	Neutral
There are good working relations between the Laboratory and the procurement unit.	3.510	0.781	0.223	Agree
The Laboratory provides specifications for all critical items of supplies.	4.060	0.539	0.133	Agree
All incoming critical items are inspected and	4.170	0.453	0.109	Agree

tested prior to use.				
There are effective inventory management procedures.	4.200	0.632	0.150	Agree
The Laboratory provides technical assistance to the procurement unit on issues related to the Laboratory	3.770	0.808	0.214	Agree

For the supplier management element, the respondents generally agreed with most of the items that were stated.

Performance Management

To explore the use of performance as a critical success factor for implementation of Total Quality Management, the researcher investigated deployment of five elements. Among the five elements, four which include existence of a performance management program, reviewing performance against set targets, identification of causes of poor performance and good performance were deployment. For the performance management element, the respondents agreed to most of the items that were given but disagreed to one. They agreed that there is a performance management program in place with a mean of 4.230 and

CV score of 0.191. The respondents disagreed that staff compensation is linked to achieving quality goals with a mean and CV score of 2.310 and 0.507 respectively. They also agreed that causes of good performance are identified and enhanced with a mean of 3.540 and CV score of 0.331, Table 2.9.

For the performance management element, the respondents agreed to most of the items that were given but disagreed to one. The respondents under performance management disagreed that staff compensation is linked to achieving quality goals. The element of linking employee compensation to achieving quality goals was not deployed, making it a barrier to implementation of Quality Management System in the Public Health Laboratories [13].

Table 5. Average Responses of The Seven Accredited Laboratories in Botswana Regarding the Five Elements Assessed Under Performance Management, In 2021.

Statement	Mean	Standard Deviation	Coefficient Of Variation (Cv)	Majority Opinion
There is a performance management program in place.	4.230	0.808	0.191	Agree
Staff compensation is linked to achieving quality goals.	2.340	1.187	0.507	Disagree
Performance is evaluated against set targets.	3.860	0.810	0.210	Agree
Root causes of poor performance are identified and eliminated.	3.800	1.208	0.318	Agree
Causes of good performance are identified and enhanced.	3.540	1.172	0.331	Agree

Discussion

All the critical success factors had a mean above of 3.0 and the critical success factors with the highest means were employee empowerment (4.77), strategic quality planning (4.74), process management (4.49), performance management (4.23), Quality culture (4.20), and Management and leadership (3.97). Employee empowerment was found to be the most important enabler to implementation of Quality Management System. Empowered employees are motivated to go an extra mile in delivering quality and reliable patients' results [14].

In addition to employee empowerment, strategic quality planning, process management, performance management, Quality culture, customer focus and Management and leadership were also identified as the most important critical success factors which form the foundation on

which the rest critical success factors are built [15].

The respondents under performance management disagreed that staff compensation is linked to achieving quality goals. The element of linking employee compensation to achieving quality goals was not deployed, making it not a good enabler to implementation of Quality Management System in the Public Health Laboratories [16].

For the strategic quality planning element, respondents strongly agreed to most of the stated items. The element on participation of selection of suppliers was identified as a not a good enabler to implementation of Quality Management System [17], meaning it was not deployed. The participants believe they should take part in the procurement of their reagents, equipment, supplies and consumables. When the employees participate in the selection of suppliers, they have a sense of ownership and utilize the resources appropriately.

Employee reward and compensations are not directly linked to performance and achievement of quality goals. So, management needs to review the reward system and the compensation policies of the country, deserving employees should be rewarded and compensated [18]. The management should uphold to the values of integrity, fairness, impartiality and neutrality. Employees do not participate in the selection of suppliers [19].

Organizations that do not evaluate the ability of suppliers to meet specified requirements most likely, but not always experience quality problems with some of the supplied materials. Satisfied employees are directly linked to satisfied customers. Satisfied employees are directly linked to satisfied customers. Quality management system emphasis on customer satisfaction and it is one of the quality elements, so it is very critical for management to work hard when it comes to the happiness of its employees, because implementation of quality management system will be easily achieved. Human resource is regarded as the critical enablers of Quality management system [20].

Conclusion

The survey results outlined four elements of the success factors that were identified as barriers to implementation of Quality Management System while the rest of elements were enablers; Effective communication between management and employees, Staff compensation not linked to achieving quality goals, Employees are rewarded for their performance and

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Employees not taking part in evaluating suppliers, hence achieving the objective of the survey.

This topic is relevant to the operations of the public Health laboratories in Botswana, because it has provided solutions to the existing problem of lack of enthusiasm by employees towards the implementation of Quality management system, hence failure to get accredited.

So, for the Public Health Laboratories in Botswana to fully implement Quality management system, management need to address the barriers identified in this research which are specific to Botswana.

In addition to the above, the researcher seeks to identify valuable information which may be used by other Public Health Laboratories for benchmarking when implementing their own systems. The findings of this research may be used to develop strategies for implementing quality management systems in other Laboratories and other countries.

Recommendations

1. There is a need to conduct another study that will focus on the non-accredited Public Health Laboratories, to get their views as well.
2. The researcher recommends the use of courier services to get information from participants that are outside town.
3. The researcher recommends sourcing funds before starting a research project in order to minimize delays in research, due to inadequate funds.

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