
Research Article

Predictors of Efficiency in the Supply Chain Management of Essential Medicines

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ABSTRACT:

A study was conducted in Limpopo Province, South Africa to assess and evaluate factors that undermine the quality of service delivery in the management of essential medicines. The study was based on a stratified random sample of size 135 health facilities scattered across the Province of Limpopo. Stratification was done by health district. Data was collected by using a structured, pretested and validated questionnaire of study. Criteria set out by Fauci (2008) and the World Health Organisation (Mendis, Fukino, Cameron, Laing, Filipe Jr, Khatib, Leowski & Ewen, 2007) were used as benchmark for the assessment of quality of services. The results showed that standards followed for storing and dispensing essential medicines were inadequate in 100 of the 135 health facilities that took part in the study (74.07%), whereas the standards followed for storing and dispensing essential medicines were adequate in 35 of the 135 health facilities (25.93%) that were selected for the study. Results obtained from binary logistic regression analysis showed that adherence to WHO standards on the proper management of essential medicines at health facilities was influenced by 3 factors. These 3 predictor variables of study were: adherence to recruitment policy, taking inventory of essential medicines regularly, and the availability of adequate storage facility for essential medicines, in a decreasing order of strength.

Key words: Limpopo Province, Supply Chain Management, Essential medicines, WHO standards, Efficiency, Odds ratios

INTRODUCTION

The study was conducted in the province of Limpopo in order to assess the overall efficiency with which essential medicines were managed in health facilities. The benchmark for adequate services was defined according to the requirements, guidelines and regulations issued by the World Health Organisation (WHO, 2007) to member countries. Essential medicines include all drugs and medical supplies that are listed on the list of medical supplies that must be made available at all times at all private and public health facilities operating in South Africa. In this regard, it is the duty and obligation of the South African National Department of Health (2016) to ensure the availability of essential medicines at all public health care facilities. The Limpopo Provincial Government of Health (2016) is equally responsible for ensuring the availability of essential medicines at all health care facilities operating in the province of Limpopo. The South African Constitution of 1996 (South African National Government Communications and Information Systems, 1996) states that all South Africans are entitled to adequate health care services in which essential medicines are required by law to be made available at all public and private health facilities. A complex supply chains web are used for manufacturing, storing, transporting and disseminating essential medicines to the patients. The purpose of this study was to assess and evaluate the degree of efficiency with which essential medicines were managed in health care facilities in the province of Limpopo by using WHO standards as a benchmark.

The study was conducted by gathering empirical data from employees whose duty is to manage essential medicines in public and private health facilities operating in Limpopo Province. According to Quick and Rankin (2005) medicines save lives and improve health, their non-availability increases the burden of disease. Many leading causes of discomfort, disability and premature death can be prevented, treated or at least alleviated with cost-effective essential medicines (Embrey, 2012). According to Constitution of South Africa, access to affordable essential medicines is a basic human right and a vital component of an efficient health care system. One of the objectives of the National Drug Policy (NDP) is therefore to ensure the availability and accessibility of essential medicines to all citizens of South Africa (NDOH, 2015). In order to address such issues, factors affecting the performance of essential medicines need to be identified in order to give guidelines to managers throughout the health system. In order to achieve this, the South Africa National Department of Health set of National Core Standards (NCS) (NDOH, 2015). Currently, Limpopo Department of Health (LDoH) has outsourced the distribution and warehousing of pharmaceuticals (Bennett, Quick & Velasquez, 2010; Summers, Moller, Meyer & Botha, 2011). From this background this study is to attempt to identify the current challenges faced by the pharmaceutical supply system in Limpopo Province and to determine factors affecting the performance of essential medicines supply chain management.

BACKGROUND OF STUDY

The study was conducted against the background of lack of accurate empirical evidence and scientific studies that could be used for identifying and quantifying key predictors of efficiency in the management, storage, administration and dispensation of essential medicines and drugs in the province of Limpopo. Health facilities in the province of Limpopo are characterised by the acute shortage of essential medicines and drugs. Although essential medicines and drugs are supposed to be managed according to criteria set out by the World Health Organisation (WHO), guidelines set out by the WHO are often disregarded and violated. As a result, the quality of health care services provided to the general population in Limpopo has reduced. The study aimed to fill the gap by conducting an empirical study that could be used for prioritising plans of actions set out by the Provincial Department of Health in Limpopo.

Essential medicines and drugs save lives and improve health, non-availability of essential medicines increases the burden of disease (Quick & Rankin, 2005). Many leading causes of discomfort, disability and premature death can be prevented, treated or at least alleviated with cost-effective essential medicines (Embrey, 2012). Access to affordable essential medicines is a basic human right and a vital component of an efficient health care system. One of the objectives of the National Drug Policy (NDP) is to ensure the availability and accessibility of essential medicines to all citizens of South Africa (NDoH, 2010). In South Africa's resource-constrained environment, with its high burden of disease, the National Department of Health introduced Standard Treatment Guidelines (STGs) and Essential Medicines Lists (EMLs) to ensure affordable and equitable access to essential medicines (NDoH, 2012). Essential medicines should therefore be available at all times, in adequate amounts and in the proper dosage forms (Sousa, 2013). Unfortunately there is often uncoordinated pharmaceutical stock management between pharmaceutical depots and health facilities, resulting in stock-outs situations at health care facilities. This situation also applied in Limpopo Province in South Africa (WHO, 2009).

According to the World Health Organization framework for health system (WHO, 2010:60), a well-functioning health system ensures equitable access to essential medicines products, vaccines and technologies of assured quality, safety, efficacy and cost effectiveness. In South Africa, the most notable criticism is the alarming shortage of essential medicines in public health facilities mainly in Limpopo public healthcare, as there is a gap between their actual and budgeted performance (Limpopo Provincial Department of Health, 2011-12). From the above deliberation, it is crystal clear that factors affecting performance of essential medicines has to be identified, hence this study is intended to cover that.

LITERATURE REVIEW

The majority of South Africans are dependent on the government to provide for their health care needs, mainly

through public health care institutions. It is therefore crucial for the government to ensure efficient availability of essential medicine at all public health care facilities. Essential medicines are considered as the most necessity to all citizens of South Africa. The South African health care system has come a long way since 1994. According to National Department of Health (NDOH) (2005:3) its building blocks are in place to provide a comprehensive health system that is underpinned by quality, skilled workforce and appropriate infrastructure. This is also reinforced by impressive constitutional, legal and policy frame that guarantees the right to access health care to all persons in South Africa.

The WHO (2007), formulated a four-part framework to guide and coordinate collective action to improve access to essential medicines by identifying the factors affecting the performance of essential medicines, which was adopted by many scholars such as Obrist et al. (2007:2) and Bigdeli et al. (2012:5). Here are factors outlined by the WHO (2004); selection of essential drugs, affordable prices, sustainable financing; and reliable health and supply systems.

The South African Government has introduced National Health Insurance (NHI) plan to ensure and mitigate the provision of equitable health care service to all South African at reasonable cost. Now the remaining most complex challenge is access to essential medicine. This research aims to shed light on the predictors of efficiency in the supply chain management of essential medicines in Limpopo public health care. The research findings of this study will be of significant importance to other researchers. Many researchers are mainly focusing on the private sector supply chain performance measurement than on public health care supply chain performance measurement hence there are lots of challenges facing essential medicines supply chain that need to be addressed. This study will eliminate the exiting gap, while adding value on the performance of essential medicines supply chain management at the public sector. This research will further provide insight on the development of a new framework, which will then be a blue print to many scholars and service providers in this discipline. It will also give guidelines to managers throughout the health system in South Africa a set of National Core Standards (NCS) for Health Establishments was launched in 2008 (NDOH, 2011).

Ensuring efficiency and optimal service delivery in the distribution of essential medicines to all South Africans is a strategic priority of all National Health Departments globally. Intensive research indicate that existing service delivery models, supply chains, frameworks and models are grossly inadequate for ensuring the efficient distribution of essential medicines in Limpopo Province (LP) (LEAP Pty Ltd, 2012). However, there is still a potential for developing an efficient supply chain model that could be used for distributing essential medicines in public health care facilities in LP.

METHODS AND MATERIALS OF STUDY

Efficiency in the proper management of essential medicines

was defined based on the degree of adherence to standards set out by Fauci (2008: 1918-1925) and the World Health Organisation (Mendis, Fukino, Cameron, Laing, Filipe Jr, Khatib, Leowski & Ewen, 2007: 279-288) for the proper storage and dispensation of essential medicines in public and private health facilities in Sub-Saharan African countries. The degree of adherence to WHO standards was measured by using a 5-point ordinal scale.

1. Strong adherence
2. Moderate adherence
3. Neutral
4. Moderate lack of adherence
5. Strong lack of adherence

As the values of variables vary from 1 (highest level of adherence) to 5 (lowest level of adherence), the degree of compliance with recommended guidelines for the proper management of essential medicines decreases. For the purpose of performing cross-tab analyses and binary logistic regression analysis, it was necessary to reduce the number of categories of 5-point variables from 5 to 2. Doing so was necessary in view of the fact that the sample size of study was only 135. Cross-tab analyses and binary logistic regression analysis were performed by reducing the number of categories of the variables of study from 5 to 2. The new categories of variables were defined as follows:

Definition of 2-point nominal scale measurements

1. Adequate adherence to WHO standards (Strong adherence or moderate adherence)
2. Inadequate adherence to WHO standards (Neutral, moderate lack of adherence or strong lack of adherence)

Cross-tab analyses or Pearson’s chi-square tests of association (Weiss and Weiss, 2012) were used for assessing the strength of association or interdependence between two or more categorical variables. At the 5% level of significance, the strength of association between two categorical variables is said to be statistically significant if the P-value is smaller than 0.05. If the P-value is greater than or equal to 0.05, it is said that the two variables are independent of each other at the 5% level of significance. In this study, all expected cell frequencies were greater than 5. As such, results of data analysis obtained from Pearson’s chi-square tests of association were all valid.

RESULTS OF STUDY

Based on the criteria set out by Fauci (2008: 1918-1925) and the World Health Organisation (Mendis, Fukino, Cameron, Laing, Filipe Jr, Khatib, Leowski & Ewen, 2007: 279-288), for the proper storage and dispensation of essential medicines in public and private health facilities in Sub-Saharan African countries, the results showed that standards followed for storing and dispensing essential medicines were inadequate according to assessments made by 100 of the 135 respondents

who took part in the study (74.07%), whereas the standards followed for storing and dispensing essential medicines were adequate according to assessments made by 35 of the 135 respondents who took part in the study (25.93%). Ten of the 135 respondents who took part in the study (7.41%) worked in depots, whereas the remaining 125 respondents (92.59%) worked in hospitals. More than half (54.81%) of respondents had worked for five years or less, whereas 45.19% of respondents had worked for six years or more at the time the study was conducted. A little more than half (52.59%) of respondents were female, whereas 47.41% of respondents were male. More than eighty percent (81.49%) of respondents were pharmacists, whereas 18.52% of respondents had other qualifications. More than ninety percent (91.11%) of respondents were permanently employed, whereas 8.89% of employees were temporarily employed.

Table 1 shows the general socioeconomic characteristics of the 135 participants who took part in the study.

Table 1: General characteristics of respondents (n=135)

Variable of study	Frequency (Percentage)
Overall efficiency in the proper storage of essential medicines by WHO standards	Adequate: 35 (25.93%) Inadequate: 100 (74.07%)
Type of health facility of respondent	Hospital: 125 (92.59%) Depot: 10 (7.41%)
Years of service of respondent	Five years or less: 74 (54.81%) Six years or more: 61 (45.19%)
Gender of respondent	Male: 64 (47.41%) Female: 71 (52.59%)
Position of employee in company	Pharmacist: 110 (81.48%) Others: 25 (18.52%)
Age category of respondent	20 to 25 years: 33 (24.44%) 26 to 50 years: 89 (65.93%) 51 to 60 years: 13 (9.63%)
Appointment status of respondent	Permanent: 123 (91.11%) Temporary: 12 (8.89%)
Highest level of formal education	Matric, certificate or diploma: 20 (14.81%) Bachelor’s degree: 81 (60.00%) Master’s degree or above: 34 (25.19%)
Reorder of medicines by pharmacist	Yes: 122 (90.37%) No: 13 (9.63%)
Reorder of medicines by nurse	Yes: 3 (2.22%) No: 132 (97.78%)
Administration staff of Supply Chain	Yes: 11 (8.15%) No: 124 (91.85%)
Other staff of Supply Chain	Yes: 2 (1.48%) No: 133 (98.52%)

Periodic review conducted	Yes: 129 (95.56%) No: 6 (4.44%)
Reorder level of essential medicines determined	Yes: 6 (4.44%) No: 129 (95.56%)
Replenishment of essential medicines done	Yes: 3 (2.22%) No: 132 (97.78%)
Backorder of essential medicines experienced	Never: 2 (1.48%) Occasionally: 43 (31.85%) Always: 90 (66.67%)
Emergency order of essential medicines	Daily: 2 (1.48%) Weekly: 19 (14.07%) Monthly: 69 (51.11%) Quarterly: 26 (19.26%) Yearly: 15 (11.11%) Not known: 4 (2.96%)

Table 2 shows actual frequency counts and percentages for problems related to distribution of essential medicines at the various health facilities that were selected for the study.

Table 2: Prevalence of distribution related problems (n=135)

Variable of study	Frequency (Percentage)
Enough essential medicines are available	Always: 9 (6.67%) Frequently: 22 (16.30%) Occasionally: 53 (39.26%) Never: 46 (34.07%) Not known: 5 (3.70%)
Average stock out duration	7 days or less: 27 (20.00%) 8 to 30 days: 72 (53.33%) 31 to 60 days: 32 (23.70%) 61 days or more: 4 (2.96%)
Experience of delay in delivery	Never: 5 (3.70%) Rarely: 10 (7.41%) Sometimes: 47 (34.81%) Often: 41 (30.37%) Always: 32 (23.70%)
Experience of forecast error	Never: 16 (11.85%) Rarely: 37 (27.41%) Sometimes: 38 (28.15%) Often: 28 (20.74%) Always: 16 (11.85%)
Conformity with standard operating procedures	Never: 0 (0.00%) Rarely: 16 (11.85%) Sometimes: 47 (34.81%) Often: 46 (34.07%) Always: 26 (19.26%)

Table 3 shows the extent of problems related to the storage of essential medicines.

Table 3: Problems related to the storage of essential medicines (n=135)

Variable of study	Frequency (Percentage)
Problems of storing essential medicines properly	Never: 14 (10.37%) Rarely: 16 (11.85%) Sometimes: 16 (11.85%) Often: 45 (33.33%) Always: 44 (32.59%)
Percentage of expired drugs	1% or less: 42 (31.11%) 2% to 5%: 42 (31.11%) 6% to 30%: 36 (26.67%) 31% to 50%: 12 (8.89%) 51% or more: 3 (2.22%)
Lack of respect for standard operating procedures and guidelines on essential medicines	Never: 11 (8.15%) Rarely: 21 (15.56%) Sometimes: 30 (22.22%) Often: 36 (26.67%) Always: 37 (27.41%)
Modification of standard transportation guidelines	Never: 10 (7.41%) Rarely: 26 (19.26%) Sometimes: 44 (32.59%) Often: 32 (23.70%) Always: 23 (17.04%)
Error in forecast	Never: 9 (6.67%) Rarely: 31 (22.96%) Sometimes: 42 (31.11%) Often: 40 (29.63%) Always: 13 (9.63%)

Table 4 shows 22 significant two-by-two associations obtained from Pearson's chi-square tests of associations. At the 5% level of significance, significant associations have large observed chi-square values and P-values that are smaller than 0.05. All in all, 134 two-by-two tests of associations were performed. Twenty two of the 134 two-by-two associations were significant at the 5% level of significance.

Table 4: Results obtained from cross-tab analyses (n=135)

List of 22 variables significantly associated with inadequate adherence to WHO standards that are recommended for the proper management of essential medicines	Observed chi-square value	P-value
Efficient methods not used	135.0000	0.000***
Effective methods not used	104.6250	0.000***
Inadequate storage of essential medicines	13.9234	0.000***
Poor forecasting	13.5082	0.000***
Order policy not followed properly	11.2706	0.001**
Recruitment policy not followed properly	9.3343	0.002**
Failure to adhere to FEF principles	8.9535	0.003**
Inadequate supply of medicines	8.9182	0.003**
Inventory problems	8.3424	0.004**
Use of unreliable transport	7.9115	0.005**
Poor communication	7.3495	0.007**
Storage policy not followed properly	7.2634	0.007**
Type of facility	6.5294	0.011*
Excess supply	6.3350	0.012*
Order cycle not appropriate enough (Wrong lead time)	6.2562	0.012*
Stock policy not followed properly	5.7367	0.017*
Ordering system not efficient enough	5.6104	0.018*
Ordering system not effective enough	5.6104	0.018*
Poor handling of essential medicines	4.4740	0.034*
Storage space not large enough	5.4542	0.020*
Distribution problems	5.2605	0.022*
Use of unqualified staff	4.0325	0.045*

Legend: Significance at * P<0.05; ** P<0.01; *** P<0.001 levels of significance

Results of data analysis obtained from cross-tab analyses showed that 22 of the 134 variables of study were significant predictors of lack of efficiency in adhering to WHO standards on the management of essential medicines at the 5% level of

significance. These 22 predictor variables of study were: failure to use efficient methods of management, failure to use effective methods of management, inadequate storage of essential medicines, poor forecasting, failure to follow policy on order, failure to follow policy on recruitment, failure to adhere to the principle of “first-expiry-first-dispensing” (FEF), inadequate supply of medicines, inventory problems, use of unreliable transport, poor communication, failure to follow policy on the storage of essential medicines, type of facility, excess supply, wrong lead-time, failure to follow policy on stock properly, lack of efficiency in ordering system, ineffective ordering system, poor handling of essential medicines, small size of storage space, problems related to distribution, and use of unqualified staff, in a decreasing order of strength.

The 22 significant variables of study identified by using cross-tab analyses were used for performing subsequent analysis by using binary logistic regression analysis (Hosmer and Lemeshow, 2013). The aim was to identify and quantify a fewer number of influential predictors of adherence to WHO standards with regards to the management of essential medicines. This was done by using the stepwise backward elimination procedure. In binary logistic regression analysis, the outcome variable of study has only 2 possible values, and not 5 possible values. The mathematical expression of the dependent variable of study (Y) is shown below:

Y: Degree of adherence to WHO standards on the management of essential medicines

$$Y = \begin{cases} 1 & \text{if respondent is inefficient in the management of essential medicines} \\ 0 & \text{otherwise} \end{cases}$$

Table 5: Odds Ratios estimated from logistic regression analysis

Predictor variable	P-value	OR and 95% Confidence Intervals of Odds Ratio
Failure to adhere to recruitment policy	0.000***	7.16 (4.67, 9.15)
Failure to take regular inventory	0.001**	6.91 (4.64, 8.04)
Inadequate storage facility	0.003**	6.16 (4.59, 8.71)

Results of data analysis obtained from logistic regression analysis showed that 3 of the 26 variables of study were significant predictors of adherence to WHO standards on the proper management of essential medicines at health facilities at the 5% level of significance. These 3 predictor variables of study were: adherence to recruitment policy, taking inventory of essential medicines regularly, and the availability of adequate storage facility for essential medicines, in a decreasing order of strength.

Table 6 shows results obtained from log-linear analysis (Agresti, 2003:39) in order to identify key predictor variables that were significantly associated with each other.

Table 6: Results obtained from log-linear analysis

Interactions of order k=2	P-value
Poor overall performance and failure to adhere to recruitment policy	0.0000
Poor overall performance and failure to take regular inventory of essential medicines	0.0000
Poor overall performance and inadequate storage facility	0.0000

The above results were tested on interactions of order k=2. The results show that poor overall performance is significantly associated with failure to adhere to recruitment policy, failure to take regular inventory of essential medicines, and inadequate storage facility for essential medicines at the 5% level of significance. These findings are fairly similar with results obtained from binary logistic regression analysis.

Factor analysis was used for reducing the number of factors that had to be analysed. The method produced 5 influential predictor variables that influenced the degree of performance of respondents with regards to the proper management of essential medicines. Factor analysis is useful in cases where the correlation among the variables of study is significant. The correlation matrix in this study showed that several pairs of variables had correlations exceeding 0.3, thereby showing that factor analysis was appropriate. In this study, a cutoff point of 0.3 was used as is recommended by Field (2010:138). The variables found to be highly significant with inadequate overall performance in the management of essential medicines were the following:

- Failure to use efficient methods for the management of essential medicines;
- Failure to use effective methods for the management of essential medicines;
- Inadequate storage of essential medicines;
- Poor ability in forecasting future supplies of essential medicines; and
- Failure to follow policy on order, in a decreasing order of importance.

The Cronbach Alpha test for internal consistency was used for testing the suitability of the 134-item structured questionnaire of study. The test gave a value of 0.8114 and an associated level of significance that was smaller than 0.001. Furthermore, Bartlett's test of Sphericity was used for testing the adequacy of the correlation matrix, and gave an estimate of 0.794, a figure that was greater than the cut-off point of 0.5, thereby confirming the suitability of factor analysis. Table 7 shows results obtained from factor analysis.

Table 7: Estimates obtained from factor analysis

Extracted factor	Eigen value	Percentage of explained variance in viability	Cumulative percentage of explained variance
Efficient methods not used	3.089	30.084	30.084
Effective methods not used	2.998	20.882	50.966
Inadequate storage of essential medicines	2.671	14.229	65.195
Poor forecasting	2.447	13.101	78.296
Order policy not followed properly	2.282	2.558	80.854

The results in Table 7 provide estimates for the percentage of variance explained by the 5 factors that were extracted by using the principal axis factoring method. Each of the 5 extracted factors has an Eigen value of magnitude greater than 1, thereby indicating its level of importance in terms of accounting for viability in business. The 5 extracted factors collectively account for 80.854% of the total variability in overall performance (the dependent variable of study). Based on the estimates shown above, it can be concluded that overall performance in the management of essential medicines is significantly and adversely affected by the following 5 factors:

1. Failure to use efficient methods of management
2. Failure to use effective methods of management
3. Inadequate storage for essential medicines
4. Poor forecasting of essential medicines
5. Failure to adhere to policy on ordering essential medicines

The 5 factors listed above accounted for 80.854% of satisfactory overall performance in the proper management of essential medicines. This figure is above 75%.

MAJOR FINDINGS OF STUDY

The objective of study was to identify and quantify key predictors of adherence to standards set out by the World Health Organization (WHO) for the proper management of essential medicines at health facilities in Sub-Saharan African countries including South Africa. The study was conducted by drawing a stratified random sample of size 135 health facilities scattered across the Province of Limpopo. Stratification was done by health district. Data was collected by using a structured, pretested and validated questionnaire of study. Data analyses were conducted by using methods such as frequency tables, cross-tab analyses (Pearson's chi-square tests of associations) and binary logistic regression analysis. Based on the criteria set out by Fauci (2008) and the World Health Organisation (Mendis, Fukino, Cameron, Laing, Filipe Jr, Khatib, Leowski & Ewen, 2007) for the proper storage and dispensation of essential medicines in public and private health facilities in Sub-Saharan African countries, the results showed that standards followed for storing and dispensing essential medicines were inadequate according to assessments

made by 100 of the 135 respondents who took part in the study (74.07%), whereas the standards followed for storing and dispensing essential medicines were adequate according to assessments made by 35 of the 135 respondents who took part in the study (25.93%).

Results of data analysis obtained from cross-tab analyses showed that 22 of the 134 variables of study were significant predictors of lack of efficiency in adhering to WHO standards on the management of essential medicines at the 5% level of significance. These 22 predictor variables of study were: failure to use efficient methods of management, failure to use effective methods of management, inadequate storage of essential medicines, poor forecasting, failure to follow policy on order, failure to follow policy on recruitment, failure to adhere to the principle of “first-expiry-first-dispensing” (FEF), inadequate supply of medicines, inventory problems, use of unreliable transport, poor communication, failure to follow policy on the storage of essential medicines, type of facility, excess supply, wrong lead-time, failure to follow policy on stock properly, lack of efficiency in ordering system, ineffective ordering system, poor handling of essential medicines, small size of storage space, problems related to distribution, and use of unqualified staff, in a decreasing order of strength. Results obtained from binary logistic regression analysis showed that Results of data analysis obtained from logistic regression analysis showed that 3 of the 26 variables of study were significant predictors of adherence to WHO standards on the proper management of essential medicines at health facilities at the 5% level of significance. These 3 predictor variables of study were: adherence to recruitment policy, taking inventory of essential medicines regularly, and the availability of adequate storage facility for essential medicines, in a decreasing order of strength.

The key aim of study was to identify and quantify key predictors of adherence to standards set out by the World Health Organization (WHO) for the proper management of essential medicines at health facilities in the province of Limpopo. The study found that only 25.93% of the 135 respondents who took part in the study believed that there was adequate adherence with WHO standards, whereas 74.07% of respondents believed that there was inadequate adherence with WHO standards. The study found that the overall efficiency with which essential medicines are managed in the province of Limpopo was adversely affected by three factors. These three factors were lack of adherence to recruitment policy, failure to take inventory of essential medicines regularly, and lack of adequate storage facility for essential medicines.

RECOMMENDATIONS OF STUDY

Based on findings obtained from the study, the following recommendations are made to the Limpopo Provincial Department of Health with a view to enhance the current quality of management of essential medicines in health facilities operating in the province:

- The performance of employees working on essential medicines must be monitored and evaluated objectively on a regular basis;

- Key Performance Indicators (KPIs) must be used for assessing and evaluating the performance of all employees working on essential medicines;
- Training opportunities must be provided to employees who need to improve their degree of performance;
- There should be strict adherence to good governance principles by all employees working on the management of essential medicines;
- A comprehensive monitoring and evaluation programme must be used for monitoring employee performance on a monthly or quarterly basis;
- Inventory of essential medicines must be taken on a regular basis;
- All employees working on essential medicines must be required to comply with the South African Essential Medicines Control Act at all times;
- All essential medicines must be stored and distributed according to WHO guidelines at all times;
- Infrastructural requirements such as building maintenance should be addressed promptly by all employees working on essential medicines;
- All employees working on essential medicines must be encouraged to promote the concept of individual responsibility for health, preventive care and informed decision-making;
- The measurement of performance must be done from a multi and interrelated perspective;
- All procurement procedures must be objective, transparent and accountable;
- All guidelines used for the management of essential medicines must be reliable, up-to-date and easy to understand and implement; and
- All guidelines on essential medicines must be linked to the organization’s value and strategy.

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