

weeks were allowed for the investigation to take place in the hospital, which hindered the researcher from obtaining as much valuable information as possible. The study was also constrained by the research period allocated as part of the final academic year this study is part of.

The remainder of this paper is structured as follows: Section 2 covers a review of the literature of lean hospital inefficiency and Ishikawa diagram; followed by Section 3 which presents the methodology followed in this study; Section 4 reveals the results of the study; Section 5 presents concludes the paper; and finally, Section 6 points out critical recommendations and suggests the way forward in terms of future studies together.

2. Literature Review

South Africa has tried different approaches to improving quality, access and cost efficiency in the health care delivery systems. It is however clear that the optimal solution is yet to be established (Kachieng'a, 2012). The country had its health system modernized in the year 2000, yet rural and urban public health care is getting worse. About 80% of South Africans do not have medical aids and have no other choice but to seek medical treatment in state hospitals. This means that almost 80% of the country's population is exposed to poor medical care yet a majority of this population are tax paying citizens (Rust and de Jager, 2010). Researchers have argued that the reason why poor quality of service exists in public hospitals mainly because they are over-burdened as many South Africans cannot afford medical aid.

A report which was conducted by Graham Anderson, a medical professor revealed that 74% of state health facilities failed to comply with cleanliness rules, it was discovered that staff attitude was substandard in 69% of facilities and 55% did not have the required medicines and supplies to give to sick patients (Graham et al., 1981). Anderson pointed out that the key issue that contributed to many of the problems experienced in public hospitals/clinics is one of poor management. State hospitals fall under the remit of the department of public works (DPW) whilst the operation of the facilities is done by the Department of Health (DOH) (Graham et al., 1981). This has in many years created an enormous challenge or those put in charge of running the hospital. For example, if a boiler gets damaged or equipment have to be repaired the hospital manager cannot contact the supplier directly, as he has to first communicate with the department of public works.

What Graham suggested was the hospital manager should be given both the budget and the responsibility to run the institution which would prove much more effective compared to the current standard operating procedure (Graham et al., 1981). If a hospital manager walks down the hospital corridor and notices that the elevator isn't working or there is a shortage of beds, he must be empowered to address the issue immediately and hold his fellow staff members accountable when the problem has not been attended to. An empowered hospital manager with control of the budget will also understand the details of the hospital expenditure and will therefore be able to recognize and root out inefficiencies and corruption. Cases of inefficiency and patient dissatisfaction will be at a much lower rate than what they have been throughout the years. After conducting this research on public hospitals, Anderson saw it fit that the private and public health sector work together to share best practices and better ways of operation in public hospitals. If the government had considered this method of operation, service and facilities in public health care sectors could have vastly improved as South Africa's private health sector is rated 4th in the continent. Certain practices could have been adopted and improvements could have been made, especially in issues relating to service. A greater partnership between the public and private health system could have also extended to providing part-time posts for medical practitioners and specialists from the private sector to work in public hospitals to improve the service received by patients.

There are three major fault lines in the public health sector. The tolerance of incompetence and leadership, governance and management failures, lack of a completely functional district of primary health care and the inability to deal decisively with the health workforce crisis. These fault lines merge to produce a number of negative consequences for patients, health professionals and policy implementation. In the first instance relative to the tolerance of incompetence, governance and management failures, patients remain powerless and bear the effects of these fault lines in their ever so often negative experiences of the public health sector and the suboptimal quality of service received (Padarath et al., 2016).

Similarly, health care providers on the 'front line' and at the bottom of the health workers find it challenging to uphold their professional code of ethics and to provide good quality service to patients in the face of an unsupportive

management environment. This proves that all problems experienced in public health sectors stem from individuals placed in managerial positions in hospitals and how they conduct their daily tasks (Padarath et al., 2016). However, one may argue and say that some state hospitals get it right, they do things better and treat patients with the utmost respect they are entitled to. The Rahima Moosa Mother and Child Hospital has about 13000 births a year and this particular hospital about 20000, but Rahima Moosa has had only five negligence pay-outs and this particular hospital has had 35 pay-outs (Child, 2017). This simply proves that some state hospitals are completely capable and willing to offer good quality service to patients.

However, the problems this hospital is experiencing are real. In 2017, a recent story revealed that a mother lost her baby just after giving birth in the hospital. It is reported that nurses at the hospital lost sight of the baby and the infant was stolen from hospital premises never to be seen by the biological mother. While investigations are still on going, one cannot help but wonder how infants were left unattended as they are still too delicate to be left without care for longer than 10 minutes? The mother was reported to be devastated and reports of a case of negligence was being opened against the hospital have been reported true by both the mother and the hospital (Child, 2017).

The Chinese story however is a different one, and one to be learned from. In March 2009, the Chinese government formally introduced a Health Care Reform with a focus on gradually achieving the goal of improving public hospitals. The reform aimed at ensuring that everyone had access to basic medical and health care services through improving medical health services at grass root level. The government used an estimated 850 billion yuan for a 3-year plan for health care improvement and 70 billion yuan was invested to county public hospitals in China (Jiang et al., 2016). The government increased health investments of each county to improve health workforce, infrastructure, salary, discipline construction and the reward of medical workers. In 2011 14 million yuan were set aside to start a pilot county called the public hospital reform in seven countries. These counties were Rong, Luzhai, Wuming, Xing'on, Tiandong, Shangsi and Yongfu located in the north, south, east, west and center of Guangxi (Jiang et al., 2016). In the course of 2012, these counties hospitals developed significantly due to the reform introduced to help improve hospitals in the county. The amount of beds and medical employees in county hospitals improved by 5.46 and 8.86 percent reaching and accommodating 3122 and 4123 pupils. The number of inpatients in county hospitals increased by 12.27 and 14.43 percent reaching an average of 2356 and 160 thousand pupils in these countries (Jiang et al., 2016). Conversely, some researchers assessed the reforms effectiveness from different viewpoints and noted that the reform was not as successful as it was noted to be. Their analysis showed that the operational productivity and efficiency of county hospitals had actually gone down rather than increase and that patient's medical expenses and cost of medicine had to some extent fallen as the health reform commenced. Other studies also revealed that patient's satisfaction was not completely improved with the implementation of the reform, instead the level of satisfaction for patients decreased with the implementation of the reform (Jiang et al., 2016).

One other success story worth mentioning is the case of cost reduction in healthcare in a public hospital in Turkey. In this particular case, the Atatürk Rehabilitation Application and Research Center of Uludag University implemented lean thinking for a period of six months. This implementation was done in order to reduce the high costs of university hospital operation posing a burden for the Turkish government and eventually develop an institution that is more productive and cost efficient through the improvement as well as shortening of invoicing processing time (Yurtkuran et al., 2017). As part of the process, lean management techniques namely process flow diagrams, value stream mapping as well as the fishbone diagrams (Ishikawa diagrams) were used to pinpoint possible issues causing quality defects and checklists for mistake-proofing (Yurtkuran et al., 2017).

Focusing on the Ishikawa diagrams, also referred to as the cause-and-effect diagrams, it is necessary to indicate that they are useful conceptualizing apparatuses used to graphically show and investigate potential reasons for a target problem. They delineate that there frequently are many contributing elements to one basic issue and the connection between contributing components. Great examples of types or categories shown on the Ishikawa diagram incorporate equipment, environment, materials, methods and process, individuals, and measurement (Weizman et al., 2016). The Ishikawa diagrams are also referred to as cause-and-effect diagrams by many academic authors who define it as another apparatus to feature and show the potential reasons for an issue in a sorted-out manner (Nathan and Kaplan, 2017). It is described as an approach that helps individuals organize their thoughts, concepts, models about sources of problems within a system.

A fishbone graph has the associated attributes which are depicted in Figure 1 (Nathan and Kaplan, 2017):

- (1) The problem being focused on is expressed at the head of the chart in a box.

The main/central bone or backbone of the "fish" comprises of a long spine with a bolt indicating the head. The bearing of the bolt suggests that the things converging further along the spine may be causative of the primary issue (appearing in the head).

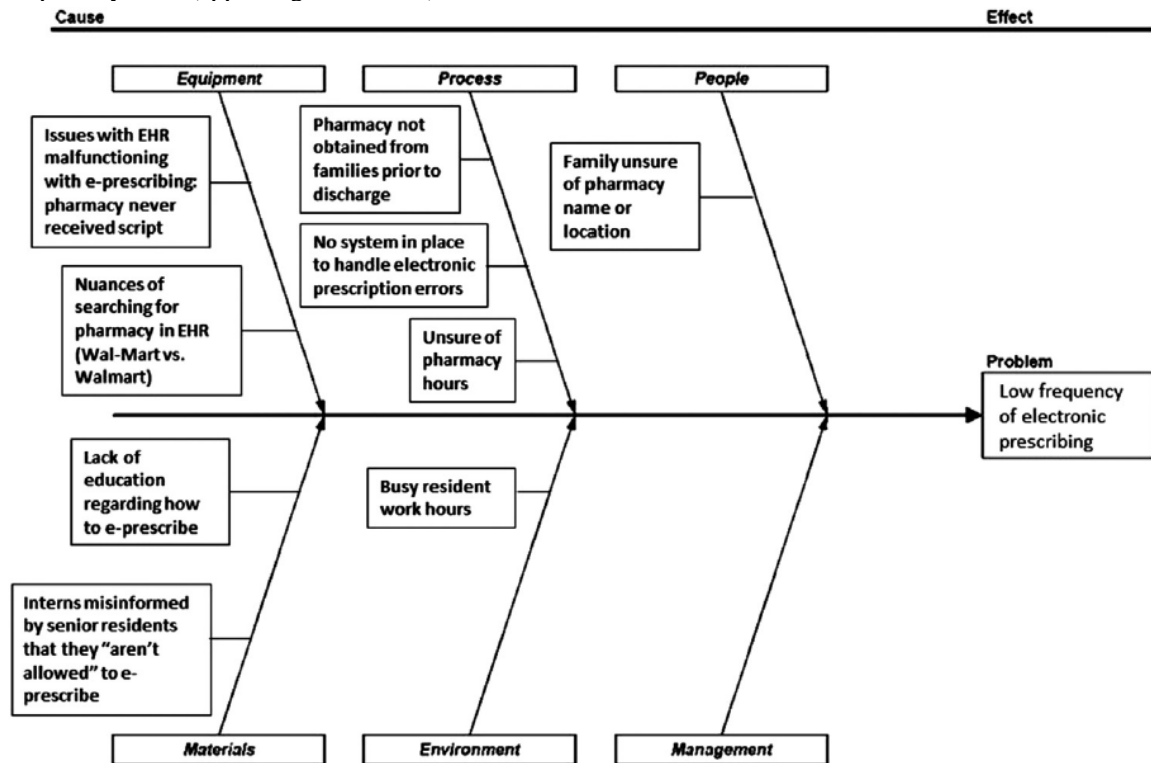


Figure 1. Fishbone or Ishikawa diagram of the process of e-prescribing (extracted from a study by Amy T.Nathan, MD, and Heather C. Kaplan, MD, MSCE, Nathan and Kaplan, 2017)

- (2) The substantial bones that append to the spine mirror the key territories that the group feels are adding to the issue.
- (3) More nitty gritty causes are portrayed by the littler bones, as they identify with the significant class (bone) to which they are appended. This arrangement of bones takes the group through a circumstances and end results show from the most profound causes to the predetermined issue.

Individuals regularly utilize the 5M's (man, materials, methods, the compelling force of nature, and machinery) as well as other 4P's (people, procedures, policies, and plant) while making circumstances and end results outlines. Remembering these zones can fortify rich discussion and guarantee that a key reason has not been neglected. Circumstances and end results graphs can be useful instruments for conceptualizing potential change thoughts or intercessions to incorporate into a key driver diagram or KDD (Nathan and Kaplan, 2017).

3. Methodology

This section will explain the methodology used to carry out this study namely observations and the mixed-method research technique, the various sampling methods and research techniques.

3.1 Observations

This paper presents the results of an observational study conducted at a healthcare facility. First, one needs to indicate that in an observational enquiry, the specialists do not mediate in any capacity yet essentially record the way of life decisions and treatment choices of the study subjects; regularly the point is to research conceivable relationship between chance components and ailment results (Sedgwick, 2012). It can be further elaborated that Observational studies draw derivations about the impact of an "introduction" or mediation on subjects, where the task of subjects to bunches is watched instead of controlled (e.g., through randomization) by the agent, therefore, observational research includes the

immediate perception of people in their characteristic setting (Gibson et al., 2012). For the purpose of this study, a cross-sectional study was followed. It is stated that in a cross sectional study, which is an observational investigation in which exposure and result are resolved at the same time for each subject, a "preview" of a gathering of people is taken (Gibson et al., 2012)

During the course of the study at the hospital, the researcher carefully watched and analyzed how employees completed tasks assigned to them, their daily routines in terms of what time each employees shift started and what time it ended and how long they took when going for tea and lunch breaks. The process of getting attention from staff and admission (moment of truths) at the hospital was also cautiously observed as the hospital is known for its reputation of negligence, long queues and lack of attention from reception staff.

This data collection method was chosen for this study because it allowed the researcher to analyses the situation in the hospital on a primary level where there was little or no bias or extortion of information. It also allowed the researcher to go as far as assessing body language, the attitude of staff and patients and many other activities that some other data collection methods would have made it harder to identify (Rust and de Jager, 2010).

An observation board was be used to record daily activities, durations of breaks, all problems that arose during admission e.g. shortage of beds, medication, power outages etc. Special attention was placed at the reception and how reception staff deal with admissions and incoming patients seeking medical assistance and the hospitals maternity ward that takes up an estimated 70% of the complaints laid against the hospital each year (Jadoo, 2014).

3.2 Questionnaire

Employees from the Administration, Cleaning and Nursing departments were given a total of 150 color-coded questionnaires for greater professional appearance and attractiveness of the hospital. Questionnaires were to be coded in yellow, blue and red respectively and employees were given a minimum of two days to thoroughly respond to the questionnaires (Papoutsis and Kallergi, 2014). Each department director was handed these questionnaires and responsible for their distributing them employees in the above-mentioned departments. Department directors were informed of the aims of the study and briefed on the anonymity policy that all questionnaires were respectively following to afford fellow employee the privilege of remaining anonymous (Papoutsis and Kallergi, 2014). Each employee at the hospital together with hospital managers/directors from the mentioned departments a was handed a questionnaire to respond to. A series of questions relating to their work, working environment, were asked in order to get a greater perspective of how each of them view the hospital and activities done in the hospital. The questionnaires will only contain closed ended questions. A different set of 100 questionnaire was given to patients in order to analyze how they perceived the hospital as well as the service it rendered to them. A pink color code was to be used for questionnaires required to be completed by patients. Waiting time, quality of service, accessibility etc. were being assessed on this particular questionnaire to capture the voice of the customer.

Table 1. Summary of the Evolution of Views on Project Management (PM)

Description of the Questions	Preference				
	1	2	3	4	5
(1) I am aware of and complete my job assignments					
(2) My background fits my job description					
(3) I take initiatives and suggest solutions to problems					
(4) I enjoy attending to patients and do my best to help them					
(5) My workload is very high					
(6) My job issues service trainings and self-development workshops					
(7) The hospital I work in is hygienic					
(8) There are opportunities for growth and advancement in the organization					
(9) I am reliable and comply with rules and regulations					
(10) The chain of command in the organization is effective.					
(11) I feel adequately and fairly compensated for time and expertise I bring into the organization					
(12) My work and effort is recognized					
(13) I am satisfied with my job					
(14) I am given the autonomy to make decisions whenever necessary.					

This data collection method was chosen because respondents had the privilege of remaining anonymous if either one of them had an undisclosed problem of revealing their identity. This allowed respondents to truthfully respond to

questions asked in the questionnaire without feeling compromised in any way possible. The questionnaires were then being collected from respondents by department directors and evaluated by the researcher. Table 1 above depicts the questionnaire handed to the hospital personnel. This particular questionnaire used in this study has been derived from a combination of two studies to add credibility to the research instrument (Gremigni et al., 2016; Maki et al., 2008).

3.3 Data Analysis

An Ishikawa diagram was drawn and used to analyze data collected from questionnaires and observations. This technique helped categorize potential causes of problems experienced or identified at the hospital in order to detect their root causes. The cause and effect diagram also helped the researcher in avoiding solutions that would have only addressed the symptoms of a much bigger problem, instead it helped channel the researcher's attention to the main problem (Rouse, 2016).

After the collection of questionnaires from respondents, the researcher combined the same information with results obtained from observations. A brainstorming session took place for possible causes of all problems identified, these problems were then rated according to their level of importance and presented as a fishbone diagram (Rouse, 2016).

3.4 The Case Study

Permission and clearance to conduct the study at the healthcare facility was obtained from the hospital director. Access to the facility was granted to conduct observations for 3 weeks in the month of September 2017, as well as distribute questionnaires to patients as well as nurses. Observations were to be conducted for a period of three weeks during that month, as the hospital usually experience high influx of patients in months leading to the festive season, according to the director.

For the first week, the researcher observed how tasks were carried out in the hospital, daily routines th.at each employee on duty did or was meant to be doing and the overall procedure that patients and employees went through when admitting, assessing, treating and discharging patients. By the end of the week the investigator had an idea of what was happening in the hospital and what processes different customers had to go through in order to get assistance from nurses as well as doctors.

During the second week, a full-scale observation took place where the investigator noted down the speed of employees locating or filling in files for patients, the body language both patients and staff assumed during the delivery/receiving of service. The attitude that each employee and patient had as well as the amount of time it took one patient to be attended by doctors were also observed. To record the time, a speed watch was used more especially in times were the patient is waiting to be assisted by a nurse, reception staff or doctor.

On the last week colour coded questionnaires were handed to three departments both for departmental employees and patients in those department. All employees were given the questionnaires to complete, however when it comes to patients only a sample of them were given different questionnaires to fill in in order to understand their perspective on how they view the hospital. Employees, as mentioned earlier in this section, were only given 2 days to respond to questions whereas patients were only given 30mins to honestly answer the questions in the questionnaire.

4. Research Results

Table 3. Questionnaires Submitted to Patients

Departments	Questionnaire Distributed	Correct (Accepted)	Incorrect (Discarded)	Response Rate (%)
Reception (Walk-in patients)	120	90	30	75%
Maternity Ward	90	75	15	83%
Casualty (ER)	60	60	0	100%
Gynecology	30	27	3	90%
TOTAL	300	252	48	84%

Table 2. Questionnaires From Patients and Hospital Staff

Departments	Questionnaire Distributed	Correct (Accepted)	Incorrect (Discarded)	Response Rate (%)
Administration	50	35	15	70%
Cleaning	50	25	25	50%
Nursing	50	40	10	80%
TOTAL	150	100	48	67%

Table 4. Summary of Questionnaires Response Rate

Departments	Questionnaire Distributed	Correct (Accepted)	Incorrect (Discarded)	Response Rate (%)
Questionnaires from patients	300	252	48	84%
Questionnaires from hospital staff	150	100	50	67%
TOTAL	450	352	98	78%

In this section the responses rates to the dissemination of the questionnaire are presented, together with the analysis of the survey results as well as findings of the observations. Tables 2, 3 and 4 above depicts the response rate from all the questionnaires distributed. Questionnaires distributed to patients showed a response rate of 84%, while those distributed to hospital staff showed a response rate of 67%. The overall response rate from all the questionnaires distributed for this study is 78%.

When the results were tallied it was noted that from the questionnaires given to employees and departmental directors/managers the factors that had the most similar and alarming responses were questions 5 = strongly agree, 6 = disagree, 8 = disagree, 10 = disagree, 11 = disagree and 14 = sometimes. From the boxes that were provided below the questionnaires that each respondent had to tick it was revealed that absenteeism, staff shortage, autonomy, poor chain of command and the lack of adequate skills for managers and employees are a major problem in the hospital.

4.1 Analysis of Questionnaire Results

Questionnaires received from respondents were categorised into two (1) from patients and (2) from hospital staff. Questionnaires given out to patients were then segmented and recounted to ensure that accurate information would be used in the study. A graphical representation of the information obtained from patients is depicted below.

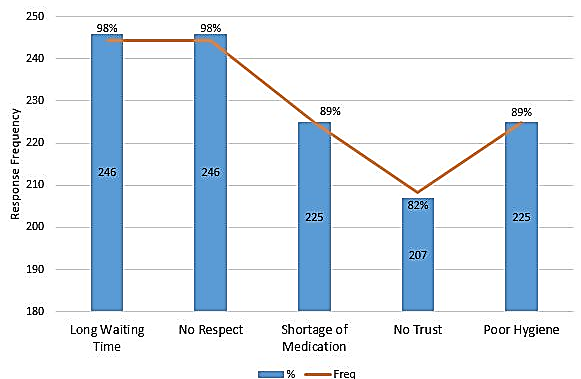


Figure 2. Questionnaire Responses from Patients

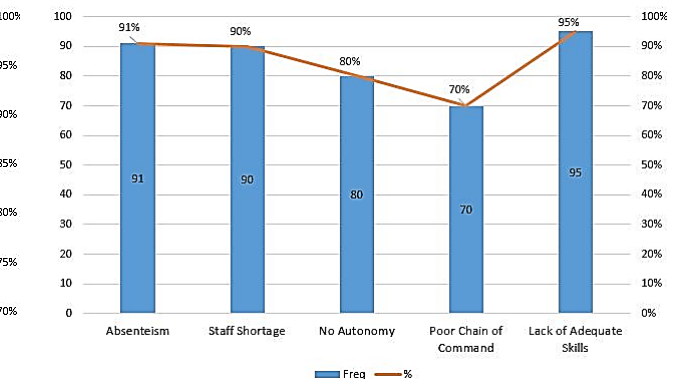


Figure 3. Questionnaire Responses from Staff Members

Five out of the ten questions to patients which highlighted negative aspects at the hospital received an alarming high number of agreement. 98% of respondents indicated that they wait longer before actually being attended to by administration clerks or doctors on call. The same percentage revealed that they are not treated with respect by hospital staff, while 89% indicated that they experienced situations whereby there was not enough medication. It is noted that 82% of respondents have indicated that they do not trust that they are in the best care whenever visiting the hospital, and finally and another 89% noted that the hygiene at the hospital is very poor.

The same method applied in analyzing responses from patients was repeated for employees and management responses. Questionnaires were respectively segmented according to the department that each respondent works in. The major problems that were identified in the questionnaires include absenteeism, staff shortage, lack of autonomy, a poor chain of command and the lack of adequate skills for both managers and general employees. The graph depicted in Figure 3 summarizes the information obtained from all hundred questionnaires that were received to tally employee responses. The graph shows that 91% of respondents report absenteeism as a major issue within the hospital, while 90% stated that staff shortage could be a major cause of inefficiency and ineffectiveness. Lack of autonomy has been reported by 80% of respondent as being one of the reasons causing major problems within the hospital. While 70 report that the poor chain of command that exists in the hospital may be the reason for employees/managements inefficiency and

ineffectiveness and lastly 95% of respondents report that the lack of adequate skills in their respective field of work may be the major cause of the hospitals problems.

4.2 Findings from Observations

From the observation that was conducted, it was noted that, most of the time, reception employees, from the moment a patient walked in, had little or no smile on their faces and in many occasions, did not greet or empathize with patients seeking medical attention. Half of the time, during the observation period, patients that were non-emergency patients were signed in at the reception after 2-3 hours sitting and waiting to be assisted by staff member. some admin assistants instead of making means to assisting such patients were in most times sitting and chatting and only made effort either when the shift manager showed up or the hospital director.

Many a time's patients that were admitted had to wait for free beds because the hospital has a serious shortage of beds, machines and pharmaceutical medicine. Patients were often given alternative medication when medication prescribed to them by doctors was found to be out of stock at the hospital pharmacy, this could be the reason that some patients took longer to recover either from wounds or other diseases due to the lack or shortage of proper medication.

4.3 Discussion

From Figures 2 and 3, it was noted that the core problems that contribute to the hospitals poor performance include poor service, absenteeism of employees, shortage of staff, lack of adequate skills and knowledge, no autonomy and an unreliable chain of command. For a better understanding of the survey results, an Ishikawa diagram was developed with the umbrella problems mentioned above highlighted and branched. Sub-branches were then branched out of the main problems that explain further explain the causes of each major problem branched on the diagram.

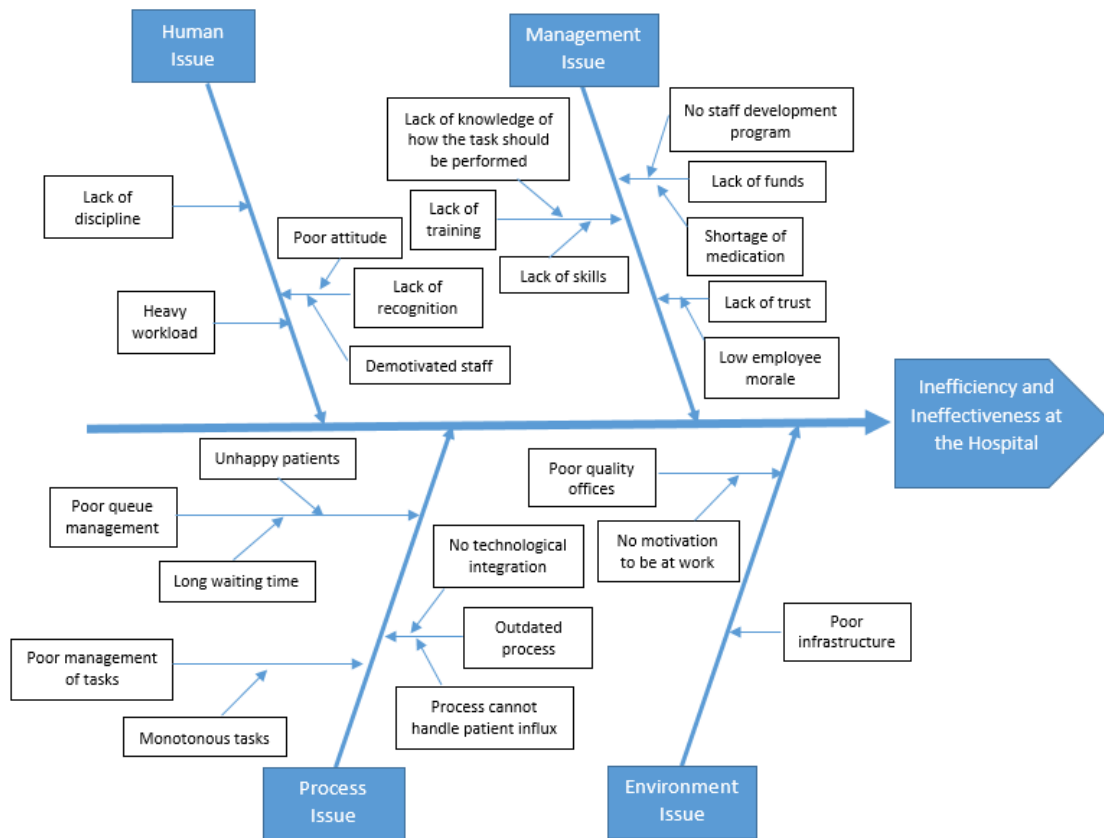


Figure 4. Example of a TWO-COLUMN figure caption: (a) this is the format for referencing parts of a figure.

The first major problem to be branched was poor service which had a total of 7 sub branches, namely: shortage of staff, burn out, fewer resources such as medication and beds, lack of discipline, no knowledge about quality service systems

and no motivation. From motivation, a sub problem was branched: no performance appraisal system which could be the reason why employees are not motivated. The second major branch was found to be absenteeism which had a total of 3 sub branches, namely: (1) Low workplace morale, (2) burn out and (3) stress which could be due to a larger work overload. The last major branch was listed as the lack of autonomy which had a total of four sub branches. The following items were listed as sub-branches: (1) an autocratic chain of command which strips away each employee's power to make immediate decisions within the hospital even in times of emergencies; (2) lack of trust from the Department of Public Works and (3) the lack of proper understanding and educational background on decision making. A sub branch was then branched out from the last branch which was related to the issue of no training and development programmes on decision making for all employees at the hospital. Because the major problems causing inefficiency and ineffectiveness together their respective sub headings were identified, the next step was to review the data and suggest possible recommendations that would either eradicate the existence of each of the problems identified or reduce them so as to improve the overall efficiency and effectiveness of every single employee at the hospital. Figure 4 represents a depiction of the Ishikawa diagram resulting from the data analysis.

5. Conclusion

The research at this hospital proved that many of the problems experienced by patients were due to the internal problems that the hospital and its management team failed to identify and attend to. The Ishikawa diagram discovered that the umbrella problems that led to poor service, inefficiency and effectiveness of staff and management were due to the lack of motivation, lack of autonomy, series staff shortage and the lack of knowledge and understanding of the hospital sector. A series of recommendations are given. Should they be implemented and maintained the quality of service and patient satisfaction will greatly improve.

6. Recommendations and the Way Forward

From the findings obtained after analyzing the data obtained in this study, the researchers have made the following recommendations:

- 1) *Workshop for employees and management should be organized:* The department of public works should organise training workshops for employees and managers in the hospital to ensure that each of them has the adequate knowledge of how to handle patients. These workshops will also educate managers on how to handle and lead staff because it is said that the reflection of staff is through its management, so, if managers are disciplined, handle complaints with absolute courtesy and encourage and motivate employees, the efficiency and effectiveness of staff will be improved overtime (Rust and de Jager, 2010).
- 2) *The chain of command should be reduced:* The department of public works should consider reducing the chain of command in order to give managers the autonomy to make decisions that will be faster and beneficial for the hospital and patients. The approach of having to report the breakdown of machines, shortage of beds, shortage of medication etc. can be handled by management to ensure that a much more speedier process takes place instead of wasting time waiting for response from the department of public works which normally responds months after the problem was reported (Rust and de Jager, 2010). To address the issue of trust that exists between the hospitals staff and the department of public works, training and developmental programmes for managers and general employees should be put in place where employees are excessively trained on how to make viable business decisions on behalf of the organisation to help improve service given to patients (Rust and de Jager, 2010).
- 3) *There should a standard appraisal system put in place at the hospital:* A performance appraisal system for all staff at the hospital should be derived where an employee seen as the hardest working is given recognition and rewarded with the employee of the month title which may come with a few benefits one that hospital or government can afford. This approach will help motivate and inspire many individuals working in the hospital irrespective of the position they hold. The overall quality of service will be tremendously improved, and many employees will start feeling appreciated and like their service in the hospital is recognised. Appraisals may take place either in groups, departments or individually depending on what management decides upon, however group or departmental appraisals are considered good and fair more especially if a company is implementing the process for the very first time (Rust and de Jager, 2010).
- 4) *Management should urgently consider development programs:* To address the issue of the shortage of hospital staff, development programmes can be started for individuals who wish to improve their skills and education in the nursing field. Six-month courses may be offered to employees willing to improve their skills

where they will be trained on the basics of nursing and how to go about assisting a sickly patient (Bentley, 2014).

More studies should be conducted in order to ascertain the effectiveness of the Ishikawa diagram use in this study.

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Biographies

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