

## **MAINTENANCE MANAGEMENT PRACTICES IN PUBLIC HOSPITAL BUILT ENVIRONMENT: NIGERIA CASE STUDY**

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### **ABSTRACT**

The study investigated the maintenance management practice in public hospital buildings in South-west, Nigeria, and identified the essential skills for maintenance managers in a hospital built environment. A total of 552 questionnaires comprising 206 for maintenance staff and 346 for users of public hospital building were collected and used for study. The survey covered 46 public hospitals representing 40% of the total number of existing public hospitals in South-west, Nigeria based on stratified random sampling technique. Data collected were analysed using mean item score, and spear-rank correlation coefficient. Findings of the study revealed that the staff strength of the maintenance departments is inadequate and they are inexperienced on hospital maintenance management. Majority of the users of public hospital buildings do not have access to any formal training on effective use of hospital facilities. The skills considered necessary for an effective maintenance manager in executing maintenance operations in public hospitals are also revealed. The cause of low motivation in executing the desired maintenance programmes was also established. The study recommends that management should ensure that the head of maintenance department has the required maintenance managers' attitude success factors before appointing them rather than being political in their selection. Management should ensure that all the staff are given adequate training for effective use of the building and the services.

**Keywords:** Public Hospitals, Maintenance Management, Maintenance Manager, Nigeria and Maintenance Practices.

### **INTRODUCTION**

As technology changes with regard to hospitals, so do maintenance requirements. Technology is time dependent. As time progresses, so does technology changes. With many developments coming to light everyday, health care facilities must be prepared to accommodate whatever the future holds (Geisler, 2002).

Maintenance management of hospital buildings is one of the complex subjects in the field of facilities management (Shohet, 2005). Contributing to this is the complex nature of hospital buildings, the delicate mechanical and electrical systems, and inadequate maintenance budgets. The qualities of the physical environment in which patients receive care affect patient recovery rate, staff satisfaction, and organization productivity. Such effects can be positive or negative (Malkin and Wiley, 1992).

Patients in a healthcare facility are often fearful and uncertain about their health, their safety, and their isolation from normal social relationships. The large, complex environment of a typical hospital further contributes to the stressful situation. While it is true that good patient care comes from dedicated individuals, it is equally true that the physical structures and hospital environment must be such that the safety and well being of patients is protected. The qualitative aspect of the building is the issue of maintenance. The need for maintenance arises because buildings inevitably deteriorate with time due to effect of various causes. In Nigeria, maintenance is given very little priority. A more progressive attitude should be to conserve the existing building stock through proper maintenance because it is a major national asset (Hutton and Lloyd, 1993). Therefore the principal proposition of this research is to evaluate the existing maintenance management practices in public hospital buildings in South – West, Nigeria and in the process identify the essential skills for maintenance managers for executing maintenance programme in a hospital built environment

### **SUSTAINABLE DEVELOPMENT AS RELATED TO HOSPITAL BUILT ENVIRONMENT IN NIGERIA**

Nigeria is one of the less developed countries (LDCs) of the world where poverty is endemic. Consequently, the main problem-facing majority of its people are how to survive economic hardship in the midst of abundant natural resources (Adenuga, 1999).

Government –owned hospitals are confronted with unique challenges that threaten their existence. According to Onifade (2003), in Nigeria, installed health facilities are as old as the hospitals themselves. Some of the medical equipment are unserviceable and need outright replacement. The colonial architecture in some of the older hospitals, which were hitherto famous for their sturdiness and functionality, has now become less attractive because of the general neglect of the buildings maintenance. Overcrowding has also led to deterioration of these facilities. The state of maintenance and the physical surroundings in public hospital buildings are present health problems in public health care delivery. Patients in a healthcare facility are often fearful, uncertain about their health and safety. This deficiency is further found to originate from the institution’s inherent government structure, which promotes inefficiencies and inflexibility through the imposition of bureaucratic impediments to operational effectiveness. Maintenance works in public hospitals are often complex in nature. The quality of the maintenance manager is another factor found to be affecting the execution of maintenance operations in public buildings (Iyagba 2005). This has a direct impact on staff performance, productivity, satisfaction and turnover. Management is a living force and it is the force that gets things done to acceptable standards. According to Nous Hospital Consultants (2002), a hospital is not a mere building, but a complex social institution that handles the dynamics of life and death situations during the process of rendering health care. Furthermore, a mistake in a hospital building management can cost the lives of many human beings at a time. These characteristics represent unique operating conditions and a bottom-line that involves much greater stakes than the profit-only vision of most business ventures. There is need to evaluate the existing maintenance management practices of public hospital facilities in order to improve their standard for effective health care delivery in South West, Nigeria.

### **AIMS OF THE STUDY**

The study aims at evaluating the maintenance management practices in public hospital buildings in South-West, Nigeria and in the process, identify the essential skills for maintenance managers in a hospital built environment..

## **OBJECTIVES OF THE STUDY**

**To evaluate the maintenance management practices in public hospital buildings in South-West, Nigeria.**

1. To find out the qualities of the maintenance manager that will influence effective maintenance management of public hospital buildings in South – West, Nigeria.

## **LITERATURE REVIEW**

### **The maintenance management of public hospital buildings**

According to Shohet, (2003), the performance of hospital buildings and their components depends to a large degree on continuous and planned periodical maintenance. Carlton, (2004) described the existing arrangement for building maintenance especially in public hospital buildings as the type that could no longer stand the test of time. Historically, in both public and the private sectors, maintenance is seen as an avoidable task which is perceived as adding little to the quality of the working environment, and expending scarce resources which could be better utilized (Higher Education Backlog Maintenance Review, 1998). In Nigeria, according to Adenuga and Iyagba (2005), public buildings are in very poor and deplorable conditions of structural and decorative disrepairs. In spite of millions of Naira spent to erect all these buildings, they are left, as soon as commissioned to face premature but steady and rapid deterioration, decay and dilapidation.

Buildings are required to provide a conducive and safe environment for various human activities. This, essentially, is the question of function. The extent to which the buildings provide the required environment for the required activity is a measure of the functionality of the building (Oladapo, 2005).

The goal of every health institution is to provide patient care, produce medical and health manpower. In furtherance of this goal, staffs and expertise based on the highest skill are motivated in an environment that is clean, conducive and patient friendly. Hospital buildings are places where care and cure should be available to the public but due to lack of maintenance, public hospital buildings have become a place where people working in the built environment and patients have allergic – like reactions to unspecified stimuli, reactions like dizziness, nausea, irritation of mucous membrane, eye and/or nasopharyngeal irritation and sensitivity to bad odour from human waste, poor toilet facilities, insufficient cleaning methods (Iyagba, 2005).

### **Desirable qualities and important skills of effective maintenance manager**

Like any other human endeavour, maintenance activities demand someone to manage them. According to Adebayo, (1991), management still remains the philosophy or practice of organised human activity, and managers are the people responsible for the conduct and control of such an undertaking. The manager is therefore concerned with the ways and means of getting a job done.

According to Geneen (1997) cited in Krass, (2000) management is not a collection of boxes with names and titles on the organizational chart. Management is a living force. To the author, it is the force that gets things done to acceptable standards.

Ubeku (1975) describes a manager as a person that organises other people to obtain desired results.

Geneen (1997) as reported by Krass (2000) describes a great manager as someone who has the courage to gamble, to delegate and to be tough. To the author, management must have a purpose a dedication, and that dedication must be an emotional commitment. It must be built in as a vital part of the personality of anyone who truly is a manager. He or she is the one who understands that management must manage.

Fox (1956), describes a good manager as somebody having ability to think creatively, constructively and clearly. To the author, a good manager must be curious, keep an open mind to the other fellow's ideas and listen. He must have the ability to judge justly or wisely, especially in matters affecting action. To him, men who are destined for leadership must be men who can make sound and wise decisions. For a superior who can see nothing but the reasons can kill every new idea at its birth why something won't work. He further describes the good executive as somebody having administrative skill, the ability to foresee the needs of his operation, to forecast its requirements in men, in materials in money, and in time. He must have the talent to resolve these needs into a practical and understandable programme.

Fox (1956), further expatriates on a good manager as someone who must be optimistic, he must radiate confidence and enthusiasm. He must be somebody who can inspire. According to the author, a discouraged and despondent executive can send a hundred or more employees' morale into the gutter. To him, a worried looking boss can touch off a wave of fear rolling throughout an organization. For these reasons, as a good manager, he must be a man of faith, faith in the people to whom you have assigned an important job, faith in yourself, faith in God.

According to Fox (1956) a good manager must be man of high integrity. The quality of integrity the honesty, sincerity, the moral posture of a top executive must be unquestionable. To the author, when a manager is given responsibility it is not for him to complain or alibi. Nor can he wait for a decree from above when immediate action is called for. He must have the confidence of his superiors that his actions will be the same whether his deeds are subject to observation or not. This is integrity. Lastly to the author, he must not be arrogant. According to the author, arrogant leaders are short lived. Arrogant managers may survive because they own business or have their boards of directors buffaloed. But their companies never attain their full potential because people cannot feel loyalty to arrogance. Blissett (2004) describes a good manager as somebody that can carry others along. Among others, to the author, "if the people involved don't understand the initiative, or if their attitude is such that they don't support it, or don't collaborate effectively in their support of it, then the initiative is unlikely to be successful".

Eade (1996), in his own contribution states that whether you work in a hospital, private hospital, health maintenance organization, government facility, your behaviour as a manager has a direct impact on staff performance, productivity, satisfaction and turnover. To the author, good management, like good health, is the result of daily conditioning. A good maintenance manager must be able to plan, teach, delegate, not dump; encourage independent thinking; build a team; listen; set an example and accept responsibility. To the author, the following are necessary for a successful maintenance manager i.e. a developing leadership skills.

- Assume responsibility for your own actions. If you are not successful, don't blame anyone else. Take it on the chin and learn from it.
- Assume responsibility for your emotional reactions. It's not what happens to you that matter; its what it means to your that determines your reaction. Stand backs and get perspective. Ask yourself, "what can we learn from this?" and it's easier to control yourself.
- Identify the potential in each of your subordinates. Remember that people tend to live up to our expectations of them. Let your people know how terrific you think they are.
- Make an inventory of the resources at your disposal and use those resources to help your staff perform better.
- Be optimistic optimism is contagious; so is pessimism. If your team is going to develop a positive, can do attitude, you will need to set the tone.
- Develop a team vision for your department. Define what the team will become – make it inspiring.
- Set specific and measurable goals to make that vision comes true. Include time frames and resource requirements.
- Treat others with empathy and respect – no matter what. Gain the independence, power, and self – respect that come from doing the right thing, without regard to what others do.
- Think less about your own needs and more about the needs of your team.
- Set an example – be a high performance work hard and smart. People will follow your example. Be honest with yourself and your team. Be open to their criticism and learn from it.
- Set a schedule for your own training and development – stick to it. Keep you growing and motivated.
- Model your management style after someone who inspires you.
- Good input = good output. Find and consistently use good sources of management guidance for reading, viewing, and listening.

Skill can be defined as an ability that can be developed which is manifested in performance. It can also be referred to as an ability to translate knowledge into action. Katz (1974) (cited in Odusami, 2001) proposed a three-skill approach to understanding the skills of an effective administrator. These are: technical skill; human skill; and conceptual skill. The first one, technical skill, is defined as an understanding of, and proficiency in a special kind of activity particularly involving methods, processes, procedures, or techniques. This skill, he argued, is the required of the greatest number of people. The second type of skill, human skill, is an executive ability of a leader to work effectively as a group member and to build cooperative effort within the team he leads. This type of skill is required in order to work with people perceptions and behaviour to supervisors, equals, and subordinates. The third type of skill, conceptual skill, is the ability of a leader to see the enterprise as a whole and recognize how the various functions of the organization depend on one another and how changes in any part affect the other. It can also be described as the ability to coordinate and integrate all the activities and interests of the organization towards a common objective. Katz (1974) argues that the three-skill concept has implications for executive development. He suggested that all managers at all levels require same competence in each of the three skills.

Katz and Thamhain (1983) (cited in Odusami, 2001) listed ten specific essential skills for program managers which are: team building skill, leadership skill, conflict resolution skill, technical skill; planning skill, organization skill, entrepreneur skill, administrative skill, managerial support building skill and allocation.

- Team building skill: This is the ability to integrate people from many disciplines into an effective team.
- Leadership skill: This is the program manager's ability to lead the team within a relatively unstructured environment. The ability to integrate individual demands, requirements and limitation into decisions that will affect overall project performance.
- Conflict resolution skill: This is the program manager's ability to understand the determinants of conflicts and to deal with it effectively.
- Technical skill: This is the capacity to manage the technological innovation and integration of solution for the success of the project.
- Planning skill: This involves the preparation of a project summary plan before the project start and it requires communication and information pressing skills.
- Organizational skill: The program manager must understand how the organization works and how to work with the organization. It requires defining and reporting relationships, responsibilities, and lines of control and information needs.
- Entrepreneurial skill: This is the program manager's ability to identify and pursue some important goals that are critical to the success of the program. Some of these goals are customer satisfaction, future growth and cultivation of related market activities.
- Administrative skill: This involves planning, staffing, budgeting, scheduling and other control techniques.
- Management support building skill: This is the program manager's ability to build favourable relationships with senior management.
- Resource Allocation skill: The program manager needs to work out specific agreements with all key contributors and their superiors on the tasks to be performed and the associated budgets and schedules.

The ability to understand financial statements, and financial ratios, and to deal with other related financial obligations is also a must for any program manager.

Though, program manager is mentioned in the description of the skills, above, they are all applicable to maintenance managers especially in the maintenance management of buildings, as their roles are similar

In health related buildings, the functions of the maintenance manager are mainly of a technical nature and concerned with the planning and control of construction resources to ensure that necessary repairs and renewals are carried out with maximum efficiency and economy. According to Adebayo (1991), the maintenance manager makes major decisions relating to organizing the execution of maintenance work, planning the work, estimating the cost of the work, determining standards, identifying and specifying the work necessary, planning inspections and controlling cost, performance and quality. To the author, in accepting these responsibilities, the maintenance manager must to realize the need for a constant awareness of, and sensibility to, the almost imperceptible changes in the building maintenance panorama, a readiness to review, and re-evaluate accepted ideas, practices, habits and customs to meet the demands of a changing world.

Seeley (1976) emphasises that the first requirement of maintenance manager is to know in detail what he is managing; without this basic knowledge he or she will not be in a position to decide his maintenance policy or prepare estimates of expenditure, which go to form his or her budget. The maintenance manager, to the author, should also retain a sense of proportion and recognise the limitations as well as the benefits of recorded data. He needs to keep detailed records of maintenance expenditure and must know what each unit cost to maintain.

Building maintenance managers are by necessity, decision-makers. Daily in the course of carrying out the maintenance process, they are faced with the task of making decisions about how to plan the works, how to obtain materials, how to guide workmen, how to organize the maintenance department, and a myriad of other matters. Adebayo, (1991), in his postulation, states that maintenance manager should have the knowledge and skills necessary to make valid decisions about what to do and how; their sources of knowledge about building maintenance include experience, authority and tradition, and that it is the knowledge of management that makes the most valuable contribution to decision-making in maintenance works. To the author, unlike the workers who are told what to do and how to do it, the maintenance managers must plan for themselves.

The personal attributes among these attributes are high personal motivation, stable personality, integrity, dedication, commitment and determination. Others are communication skills, ability to set up, organize record and control meetings. It also includes personnel selection, and man management skills. In conclusion, for an efficient performance of our public health buildings, there must be an effective maintenance manager with the required skills and qualities in order not to jeopardize the goal of establishing our public hospitals.

## **METHODOLOGY**

This study adopted descriptive survey techniques, using the quantitative research approach as considered appropriate (Amarantunga, Badru et al, 2002). A total of 46 public hospitals in South-West, Nigeria representing about 40% of government owned hospitals were sampled for the study out of a total of 114 public hospitals (excluding health centres.) The technique adopted according to Easterby – Smith 1991 as cited in Oladapo's (2005), is to affords an objective measurement of the subject under analysis and facilitates replication (adoption and verification) by others. A stratified sampling method is used. The study population comprises the users, who are the medical staff, administrative, and management staff inclusive of maintenance technical staff and the maintenance Manager/Engineer of the selected public hospitals in Southwest, Nigeria. This research focussed on the evaluation of maintenance management practices in public hospital buildings. The area for this study is the entire South Western Nigeria. The study area consists of six states namely Lagos from which 9 public hospitals were chosen for the study, Ogun State (11), Ondo State (6), Ekiti State (6), 5 in Osun State (5) Oyo State (9) respectively. The states are located within the same geographical zone and have similar social backgrounds. Analytical tools used include mean item score, percentages and spear-rank correlation coefficient.

Map of Nigeria showing the six states within the South Western Nigeria, selected for the study



## RESULTS AND DISCUSSION

### The Hospitals Studied

South-west, Nigeria consists of six states namely Lagos, Ogun, Ondo, Ekiti, Osun and Oyo. They are located within the same geographical zone, having similar social backgrounds. In all, the region has a total of 114 public hospitals (Health – Centres exclusives). From the population, forty-six (46) hospitals including all the federal owned hospitals and selected state hospitals were examined for the study. This represents about 40% of government owned hospitals.

Table 1: Sample frame selected for the study

State	No of Federal owned hospitals	No selected for the study	No of State owned hospitals	No selected for the study	Total No selected for the study	%
Ekiti	1	1	14	5	6	13.0
Osun	1	1	11	4	5	10.9
Ondo	2	2	13	4	6	13.0
Oyo	1	1	21	8	9	19.6
Lagos	4	4	18	5	9	19.6
Ogun	2	2	26	9	11	23.9
<b>Total</b>	<b>11</b>	<b>11</b>	<b>103</b>	<b>35</b>	<b>46</b>	<b>100</b>

Table 1 indicates the total sample frame used for the study. A total of 46 public hospitals including all the 11 federal owned hospitals in South-West, Nigeria and 35 from all state owned hospitals within South-West, Nigeria..



Table 2: The survey returns

State	Maintenance staff response			Users		
	Sample size	Number returned	Response rate %	Sample size	Number returned	Response Rate %
Ekiti	30	25	83.3	60	48	80
Osun	25	20	80.0	50	34	68
Ondo	30	24	80.0	60	58	96.7
Oyo	45	40	88.9	90	49	54.4
Lagos	45	45	100.0	90	75	83.3
Ogun	55	52	94.5	110	82	74.5
<b>Total</b>	<b>230</b>	<b>206</b>	<b>89.6</b>	<b>460</b>	<b>346</b>	<b>75.2</b>

Table 2 reflects the response to the survey carried out. The response rate was 89.6% and 75.2% for maintenance staff and users of public hospitals respectively. An indication of good response to the survey carried out.

Table 3: Analysis of Maintenance staff length of service.

Length of service	Frequency	Valid percent	Cumulative percent
Less than 10 years	109	57.1	57.1
10 – 19 years	59	30.8	87.9
20 – 29 years	20	10.5	98.4
30 and above	3	1.6	100.0
<b>Total</b>	<b>191</b>	<b>100.0</b>	

Table 3 describes the length of service distributions indicating that majority of the respondents have a working experience less than 10 years (57.1%) while maintenance staff with better experience through the length of service are less than 15% altogether (respondents with 20 – 30 years and above). This is an indicator that the maintenance work execution may be lacking maintenance technical expertise in the execution of maintenance programme especially in the public hospitals in South-west, Nigeria.

#### Analysis of Building Usage

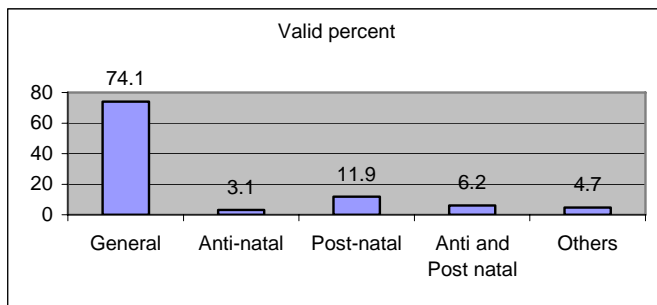


Fig:1. Analysis of Building Usage.

Fig 1: indicates the use of the buildings for health care delivery. From the analysis there is an indication that majority of the hospitals examined operate their buildings for general treatment. There are needs for the development of more buildings for specialist treatment.

Table 4: Analysis of Full-time employees in the Maintenance Department

No of employees	Frequency	Valid percent	Cumulative percent
1 – 10	66	35.7	35.7
11 – 20	89	48.1	83.5
21. – 49	21	11.3	95.1
50 and above	9	4.9	100.00
<b>Total</b>	<b>185</b>	<b>100.0</b>	

Table 4: indicates that most of the maintenance departments in the public hospitals have an employee ranging between 1 and 20 with 48% of them having not less than 11 to 20 employees in their organization. This is contrary to an established fact in Nigeria where at least a minimum of 25 maintenance staff, including all their technical personnel of diverse field in the built environment, their crew-members and others. (Iyagba, 2005). This is an indication that there is inadequate staff strength in maintenance departments more so that much is needed especially in a sector that handles the dynamics of life and death during the delivery of health services.

### Users of hospitals building survey

Table 5: Analysis of Users Sample by their departments

Department of the Users	Sample Size	% of the population	No Returned	Response %
Medical staff	184	40	184	100
Administrative staff	138	30	100	72.5
Management Staff	46	10	30	65.2
Patients	92	20	30	32.6
<b>Totals</b>	<b>460</b>	<b>100</b>	<b>344</b>	<b>74.8</b>

Table 5: indicates the department of the users of public hospital buildings sampled in the South West, Nigeria. 40% of the total population sampled was allocated to medical staff. The justification for this was that they constitute the highest percentage of workers in a hospital environment. This is followed by the administrative staff (30%) with a proportion of about 10% of total management level. Response from the patient was found to be very low. This is actually expected from the respondents.

### Provisions of Training programme for users

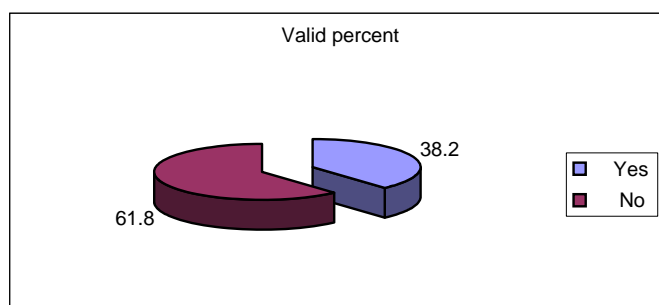


Fig 2: Provisions of Training programme for users on how to effectively manage the facilities within the hospital buildings.

Fig. 2 reflects the response by the users on whether the management made any provision to educate them on the use of public hospital facilities. The result shows that only 38.2% agreed that provisions were made. This is an indication of poor orientation on the part of management.

**Training type given by the management to the users through Maintenance Department.**

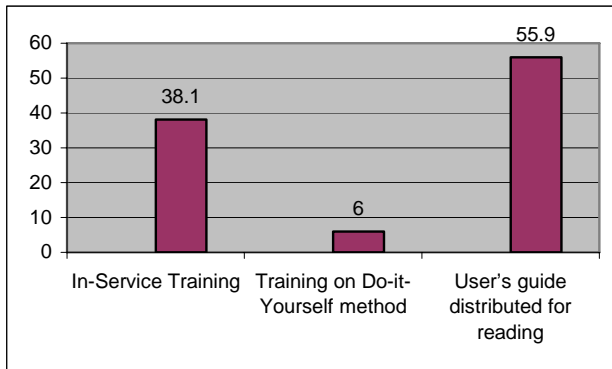


Fig 3: training type given by the management to the users through Maintenance Department.

From Fig.3, 55.9% of the users of public hospital facilities have their knowledge acquired on effective management of the facilities through the reading of users' guide while only 38.1% were sent on in-service training. This is found not to be adequate for the maintenance management of hospitals facilities, more so that the environment is very sensitive and it handles the dynamics of life and death especially during health care delivery.

**Table 6: The need for training to improve the skills and productivity of maintenance staff.**

The option for training for effective performance	Frequency	Valid Percent	Cumulative percent
Yes	169	95.5	95.5
No	8	4.5	100.
Total	177	100.0	

Table 6: indicates the willingness of the maintenance operatives to acquire better skills through training. This will enhance their productivity and improve the performance of public hospital buildings in South West, Nigeria.

**Table 7: Type of Training provided by the Hospital Management**

Type of training	Frequency	Valid Percent	Cumulative Percent
In-service training	59	29.5	29.5
Workshop/seminar	131	65.5	95.0
Higher Education	10	5.0	100.0
Total	200	100.0	

Table 7: indicates that the management of public hospitals in South West, Nigeria only provide seminars and workshop training in most case for their maintenance staff. 29.5% of the respondents claimed to have in-service training while only 5% have access to higher education.

### Adoption of Formal Maintenance policies

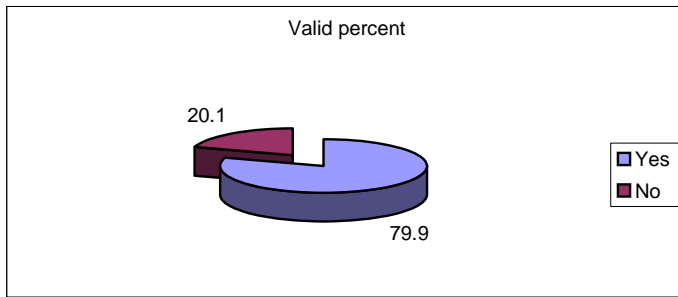
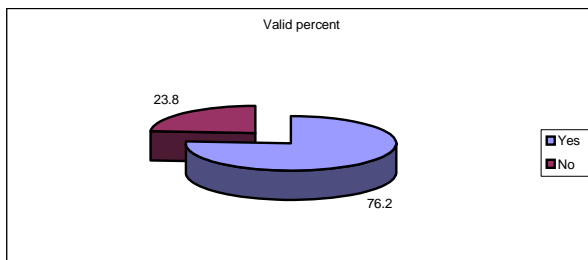


Fig 4: Adoption of Formal Maintenance policies

Fig-4 indicates that majority of the public hospitals in Southwest, Nigeria have formal maintenance operation policies. This supposes to enhance the performance of buildings for effective healthcare delivery.

### The use of maintenance logbook



.Fig 5: The use of maintenance logbook

Fig 5 shows that there is an adoption of maintenance log-book by many of the maintenance operatives in public hospitals in South-west, Nigeria. This is an indication that proper records of work done are being kept i.e. Defects reported by the users and defects repaired are being kept for record purpose.

### The use of maintenance manual to guide the maintenance operatives.

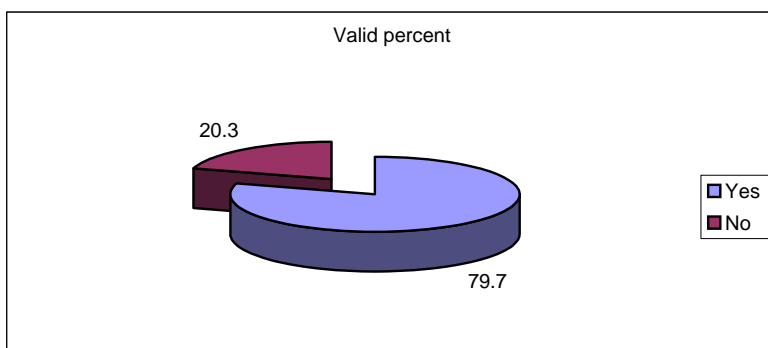


Fig-6: The use of maintenance manual to guide the maintenance operatives.

Fig- 6, indicates that the maintenance operatives are provided with maintenance manual to guide their maintenance operation. With the maintenance manual better performance are expected from the operatives.

### Level of Motivation of Maintenance staff by the management

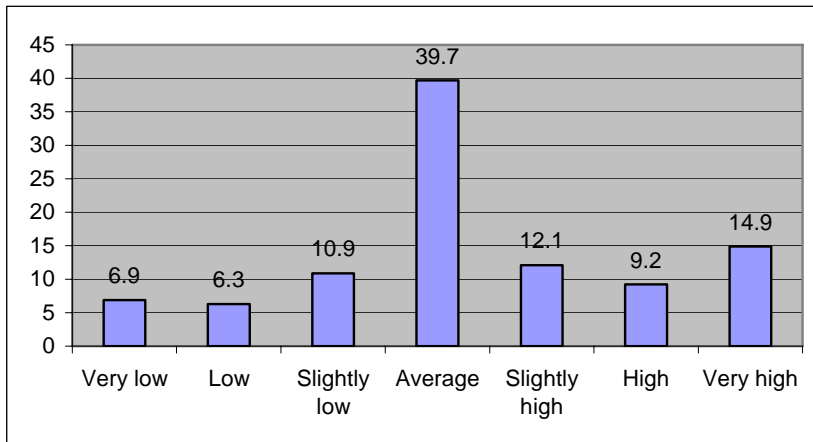


Fig 7: Level of Motivation of Maintenance staff by the management.

Fig.7 describes the level of motivation as to the effective implementation of maintenance programme by the maintenance staff in public hospitals in South-West, Nigeria. The result indicated average as rated by the maintenance staff.

Table 8: Causes of low motivation of maintenance workers.

Demotivating factor	Frequency	Valid percent	Cumulative percent
Lack of working tools/ equipment/materials	38	50.7	50.7
Irregular payment of salaries	12	16.0	66.7
Delayed promotion	8	10.7	77.4
Poor pay	6	8.0	85.4
Lack of opportunities for training/development	6	8.0	93.4
Job insecurity	4	5.3	98.7
Unsafe/unhealthy working condition	1	1.3	100.0
Total	75	100.0	

From table 8: the response to causes of low motivation is found to be very low (75 respondents). Half of the respondents (50.7%) rated lack of working tools/equipment/materials as a cause of low motivation in executing the desired maintenance programmes in public hospitals. Other demotivating factors are; the irregular payment of salaries (16.0%), delay in promotion (10.7%), poor pay (8%) etc.

### Ranking of Maintenance Managers' attribute success factors in the management of public hospital buildings in South West, Nigeria.

In the structured questionnaire, the respondents were asked to evaluate the importance of the following skills for an effective maintenance manager using (1) Not important (2) Of little importance (3) Somewhat important (4) Important (5) Very Important. The degree of significance of 20 success factors drawn from literature and pilot test are as shown below:

**Analysis of essential qualities of leadership effectiveness of maintenance head in public hospitals in South West, Nigeria**

**Descriptive Statistics**

Table 9: Ranking of Maintenance Managers attributes for maintenance work efficiency.

Hypothesized factors	Mean	Rank
Professional Experience	4.31	1
Intelligence	4.28	2
Technical Knowledge	4.23	3
Communication	4.18	4
Qualification	4.15	5
Human Relation Skills	4.14	6
Problem Solving	4.12	7
Organising	4.12	7
Authority Level	4.1	9
Financial management	4.1	9
Leadership and Motivation	4.08	11
Decision Making	4.07	12
Quality Management	4.07	12
Commitment	4.06	14
Time Management	3.99	15
Emotional Maturity	3.96	16
Delegating	3.96	16
Planning and Goal Setting	3.96	16
Listening	3.92	19
Creativity	3.86	20

Table 9: Shows the rankings of **20** success factors by all the respondents. The means of all the first 14 factors are greater than 4 – equivalent to “Important and Significant” on a five point Likert scale in the questionnaire. Thus, they are considered to be critical success factors for maintenance manager’s attributes in the maintenance management of public hospital facilities in South Western part of Nigeria. Others such as time management, emotional maturity, delegating, planning and goal setting, listening and creativity are also very necessary for an effective maintenance management of hospital facilities as they are also rated above average.

The tests show that Spearman’s rank correlation coefficient between the variables are **0.772** and **0.636**, respectively. Moreover, **correlation is significant at 0.01 level of significance**. This implies that there is a strong agreement among the maintenance manager attribute variables of success factors.

**SUMMARY OF FINDINGS**

The study revealed that more than half of the maintenance staff (57.1%) in public hospitals in South-West, Nigeria has a working experience less than 10 years within the maintenance organisation. This is a factor that may affect job performance of the maintenance operatives. The staff strength of the maintenance department in public hospitals is found to be inadequate more so that it is a sector that handles the dynamics of life and death especially during the delivery of healthcare services. This is found to be inadequate based on the study carried out on sick building syndrome (Iyagba, 2005). Majority of the users (61.8%) have no access to any training programme especially on the effective management of facilities within the hospital environment. The few percentage claimed to have got access to training was by reading the maintenance users’ guide distributed by the management.

There is an existing formal maintenance policy guiding the maintenance work execution in 79.9% of public hospitals evaluated in South-West Nigeria. There is an adoption of maintenance log-book as claimed by 76.2% of the respondents. Workshops and seminars are the major training (65.5%) given to the maintenance operatives. The maintenance operatives are found not to be well motivated. The low motivation was attributed to lack of tools /equipment /materials in executing the desired maintenance programmes in hospitals. Other reasons are irregular payment of salaries, delay in promotion etc.

In the evaluation of importance of skills for an effective maintenance manager, professional experience, intelligence, technical knowledge, communication, qualification, human relation skills, problem solving, organising, authority level, financial management, leadership and motivation, decision making, quality management and commitment were ranked very high among others as maintenance managers attributes success factors in the management of public hospital buildings in south western part of Nigeria.

## **CONCLUSION**

From the results obtained in this study, the following conclusions are made.

The staff strength of the maintenance department in public hospitals in South West, Nigeria is inadequate. This is an established fact based on the findings carried out on the factors responsible for sick building syndromes in public buildings in Nigeria (Iyagba, 2005). They do not have much experience on hospital maintenance management. Majority of the users of public hospital buildings do not have access to any formal training programme on effective use of hospital facilities.

There is an existing maintenance policy guiding the maintenance work execution, however, the major training found to be given to maintenance operatives are workshops and seminars, which are very inadequate for effective performance especially in a sensitive environment like hospitals. The study also revealed that maintenance operatives are not well motivated and this was attributed to lack of tools/equipment/materials in executing the desired maintenance programmes in hospitals. Others are irregular payment of salaries, delay in promotion etc.

Important skills found to be necessary when considering an effective maintenance manager for hospital maintenance management works are: professional experience; intelligence; technical knowledge; communication skills; qualifications; human relation skills; problem solving techniques, organising, authority level, financial management, leadership and motivation, decision making, quality management and commitment amongst others.

## **RECOMMENDATION FOR IMPROVED SUSTAINABLE DEVELOPMENT**

In the light of the research findings, and conclusions, the following recommendations are made in order to improve on the practice of maintenance management of our public hospital buildings including services in South West. Nigeria.

- Maintenance staff are to be well motivated in order to deliver their best during the maintenance work execution. Management should ensure that the head of maintenance department possesses the required skills for the maintenance management of the hospital facilities. Progress report of work done is to be submitted to the management through the head of maintenance department.

- Government should encourage individuals or other stake holders to contribute towards healthcare delivery services since government subvention alone can no longer be sufficient to meet, particularly due to the high demand of contemporary developments in healthcare technology.
- Inefficiencies and inflexibility through the imposition of bureaucratic impediments to operational effectiveness should be avoided in hospital environment due to the sensitivity of the services being rendered.
- Maintenance staff and users of hospital buildings should be given opportunities for further training on their jobs also on effective use of hospital facilities. This is necessary to reduce the occurrence of defects, which will consequently bring about better physical and functional hospital building elements and services.

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