



The Lagos Journal of Environmental Studies



Published by:
Faculty of Environmental Sciences
University of Lagos, Nigeria

Vol. 7 No. 2
2010

Poor Maintenance Culture of Public Hospital Buildings in Lagos State, Nigeria

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Abstract

The performance of hospital buildings and their components depends to a large extent, on continuous and planned need to identify the causes of lack of maintenance responsibilities among maintenance staff, users of hospital building and construction professionals. Level of significance were identified through administered questionnaire, hypotheses were postulated to know if relationship that exists between the identified level of significance of causes of lack of maintenance responsibilities of maintenance staff and construction professionals and to determine whether there is difference in state of maintenance identified by users and maintenance staff. Significance level of causes of lack of maintenance was identified using mean item score. The result indicated that there is no relationship between identified level of significance of causes of decay and lack of maintenance by maintenance staff and construction consultants. There is significance difference in the state of maintenance identified by maintenance staff and users of the public hospital buildings. This study identifies various factors that cause lack of maintenance responsibilities in order of their significance level.

Keywords: Hospital building, maintenance responsibilities, lack and significance level

Introduction

The size and function of the maintenance department will vary in almost direct proportion to the size of the hospital. Its functions usually include the remodeling of old facilities where change has made this necessary, installations of new equipment bought ready for use and also the development and construction of special equipment. At times, its functions are outlined to include the construction of new facilities where a works department is non-existent. The goal of every health institution is to provide patients care, with some producing medical and health manpower. In furtherance of this goal, staff and expertise based on the highest skill are motivated in an environment that is clean, conducive and patient friendly. Bamisile (2004) points out that maintenance is essential in a building so that value for money can be achieved, the building can perform effectively and users can obtain maximum satisfaction from the use of the building.

Buildings are man made assets which require regular maintenance if they are to contribute to the national economy. Inadequate maintenance has caused economic loss in terms of value for money invested in constructing many hospital buildings. The loss results from the wear and tear such buildings experience at premature age. Non involvement of maintenance officer during design and construction of hospital buildings and non availability of as-built drawings at completion further contribute to this loss of value. The research highlights the causes of lack and identifies the most important causes of lack of maintenance responsibility in hospital built environment. The study also identifies the significant causes of neglect and the state of maintenance responsibility in public hospital buildings.

Literature Review

According to Nours 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. Oladapo (2005) gives the definition of maintenance by committee on maintenance and protection of public property (1979) as "all works undertaken to keep or restore a property to a state of preservation and

acceptable standard for its present and intended use". British Standard BS4778 (1991) Part 3, Section 3.2 defines maintenance as the combination of all technical and administrative actions, including to keep an item in, or restore it to a state in which it can perform a required function. Smith (2003) also defines maintenance practice in two separate categories. There are first, the standards which are the measurable performance level of maintenance execution and then there are the methods and strategies that must be practised in order to meet the standards.

According to UNCH (2003) maintenance is defined as a set of activities or procedures conducted to return or keep a infrastructure system in a fully-functioning or operational condition. Arditi and Nawakorawit (1999) also define maintenance as the preservation of a building, plants and equipment so that it can serve its intended purpose and as a combination of any actions carried out to retain an item in, or restore it to, an acceptable condition. The cheapest way to preserve equipment and to keep it running efficiently is to ensure that it does not break down and to renew or replace before it becomes obsolete. This is ensured by inspecting at regular intervals and replacing or repairing parts that appear likely to wear out. A quick walk around most hospitals would reveal a host of minor maintenance defects in the building and equipment. According to Colen and Brito (2002) maintenance is a technical and economical action that tries to raise the quality level of a building element and / or restore to the initial performance level in accordance with certain requirement. Inspection and maintenance must be continued and must be done thoroughly if efficiency in the use of buildings, machinery, equipment, furniture and labour is to be achieved.

The performance of hospital buildings and their components depends to a large degree on continuous and planned periodic maintenance, which challenges owners and facility managers to institute precise planning based on a well-structured maintenance program. Despite the ever-growing need for lower operational costs, facility managers must ensure that facilities are constructed and maintained efficiently with

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compromising safety. Due to the growing complexity of hospital buildings, the increasing proportion of system in them, higher levels of service, higher portion of maintenance life cycle cost of building has placed an increasing demand on maintenance programmes to provide tools that would quantitatively predict the service life of building components at different levels of performance (Shohet, et al, 2002). Furthermore, decision makers concerned with the maintenance of hospital buildings are frequently called upon to decide whether maintenance tasks are to be executed by in-house staff or contractors.

Because patient care is the foremost priority for health care organizations, building repairs should be conducted as soon as the defect is discovered. Regular inspections of hospital facilities are essential for extending building longevity. In addition to these informal daily inspections, some major installations in hospital like lift, air conditioning, generators, boreholes and treatment, plants swimming pools, pumps, fire installations, pest eradication, refuse disposal and major building components such as roof, will also need regular maintenance. (Nwankwo, 2004)

Causes of Lack of Maintenance in Public Hospital Buildings.

Many factors have been identified in literature to be responsible for lack of maintenance responsibilities. Notably, Udia (1989) highlights the following causes of lack of maintenance. General apathy, ignorance and disregard of maintenance work. This explains why facilities are in deplorable state crying for maintenance. Others includes poor funding of hospital maintenance unit. Lack of skilled manpower to undertake work especially in hospital buildings designed and constructed by expatriates, lack of appropriate system of maintenance, the existing arrangement of maintenance and repairs are no longer sufficient to cope with the increasing number of assets to be maintained. At design and construction stages, maintainability issues related to hospital buildings are not considered. Design problems are usually hard to solve as it may involve complete reconstruction of element of the building or large sections of it. This may be avoided or reduced by involving at the design stage professional experts, including highly competent and experienced maintenance managers. Attitudinal problems such as the attitude of the public toward public hospital buildings, to say the least, is negative and generally retrogressive. Problems emanating from political decision: include obsolete equipment and project designs imported owing to the preponderance of undue political influence or consideration on what should have been purely technical decisions. Research and development problems are lack of adequate funds and interest in this direction.

Maintenance Priorities in Hospital Buildings

In building construction, the aim of maintenance is to preserve a building and its content in its initial state as far as practicable, so that it effectively serves its purpose and enhance value (Oyefeko, 2001). The main purposes of maintaining buildings structure which is also applicable to hospital buildings are to retain the value of hospital buildings, maintaining the hospital in a condition in which it continues

to fulfill its functions, to present good appearance or make the hospital more attractive to upgrade the standard of hospital building in order to attract higher patronage keeping hospital building wind tight and water tight others include to ensuring the safety of occupants, visitors and general public within the hospital building and its surroundings still it is important to maintain services, heating, lighting, escalators, fire systems in hospital buildings and to maintain decorative surfaces and carry out adequate cleaning of the hospital surroundings. In addition, it is of significance to prevent the deterioration of the hospital building fabric.

The amount of hospitals building maintenance work can be reduced by improved method of design, specification, construction and effective maintenance. Effective maintenance management embraces many skills technical knowledge to identify maintenance needs, to specify right remedies, understanding of modern scientific techniques of management, knowledge of property and contract law, and an appreciation of sociology. In addition, the need for comprehensive hospital equipment and building maintenance manual cannot be over emphasized. Hospital equipment maintenance manual provides hospital engineers and other health care professionals involved with the operation and maintenance of hospital physical plant and equipment comprehensive technical maintenance information. This material is useful for both the user and the hospital administration because it is prepared in a simple way. This generic approach in hospital equipment preventive maintenance is unique in medical facilities. With this approach, it is possible to assess different manufacturers' systems and products, while emphasizing general procedures for preventive maintenance.

Methodology

The target areas for this study are public hospitals and medical research centre in Lagos State. The public hospitals and medical research centre are target areas because they are government owned and controlled and every citizen has equal access to it. The blue print for data collection used for this study is Ex post facto (After the fact) research and cross sectional research designs. A set of structured questionnaires are employed for the gathering of useful data and information required on every aspect mentioned for the study. Other secondary data are extracted from established theories, research findings, through internet, journals and books.

The primary source was through interviews, structured questionnaire and personal observation. The secondary data are from findings, internet, journals and books. Questionnaires were designed to gather data from five different government owned hospitals in Lagos state. The study focused on maintenance staff, users of public hospital buildings and construction professionals. 40 sets of questionnaire were distributed to both maintenance staff and users of hospital buildings while 45 sets were distributed to construction professionals.

Data Presentation and Analysis

Table 1: Maintenance staff and users of hospital buildings

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Buildings	Sector	Maintenance staff						Users			
		Q.D	QR (%)	Q.P (%)				Q.D	QR (%)	Q.P	
A	General hospital(Luth)	8	7	87.5	5	62.5	(%)	8	6	75	5
B	Special hospital (orthopedic)	8	5	62.5	5	62.5	62.5	8	6	75	5
C	Main laboratory (Yaba) (orthopedic)	8	5	62.5	5	62.5	62.5	8	6	75	5
D	General hospital (Ikeja)	8	6	75	5	62.5		8	7	87.5	5
E	General hospital (Island Maternity)	8	5	62.5	5	62.5		8	7	87.5	5
								62.5			

Table 1: Responses from maintenance staff and users of hospital buildings
Q.D= Questionnaire Distributed, Q.R = Questionnaire Retrieved, Q.P = Questionnaire Processed
Table 1 shows the total number of questionnaire distributed, returned and processed.

Causes of Lack of Maintenance Responsibilities in Public Hospital Built Environment.

Table 2: Reasons for lack of maintenance (Maintenance staff)

Reasons for lack of maintenance responsibilities in public hospital buildings	^M.I.S	Ranks	Comments
No effective maintenance due to de-emphasis on training	0.91	1	***H.S
Natural deterioration due to age and environment	0.88	2	H.S
Lack of support for innovation	0.84	3	H.S
The scale of effort, extent of facilities and resource of maintenance operation	0.84	3	H.S
Attitude of the Public and mis-use of facilities.	0.84	3	H.S
Complexity in design and non-involvement of expert.	0.82	6	H.S
Frequent shortage of material and spare part	0.82	6	H.S
Use of poor quality component and materials.	0.80	8	**S
Persistent breakdown through indiscipline and ignorance	0.79	9	S
Absence of planned maintenance	0.79	9	S
Procuring of spare part becomes difficult.	0.78	11	S
No adoption of appropriate maintenance cycle for hospital buildings	0.77	12	S
Lack of skilled manpower to maintenance work in building design construction.	0.72	13	S

*** Highly important, ** Important, ^ Mean item score

Table 2 shows the rating of causes of lack of maintenance responsibilities. No effective maintenance due to de-emphasis on

training, natural and resource involvement of materials, pers procuring of sp manpower to m

Table 3: Reasons for lack of maintenance in public hospital buildings

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training, natural deterioration due to age and environment, lack of support for innovation, the scale of effort, extent of facilities and resource of maintenance operation, attitude of the public and mis-use of facilities, complexity in design and non-involvement of expert, frequent shortage of material and spare part are highly important while use of poor quality component and materials, persistent breakdown through indiscipline and ignorance, absence of a firm of planned maintenance program, procuring of spare part becomes difficult, no adoption of appropriate maintenance cycle for hospital buildings and lack of skilled manpower to maintenance work in building design construction are important.

Table 3: Reasons for neglect of maintenance (Professional in Construction Industry)

Reasons for lack of maintenance culture in public hospital buildings	^M.I.S.	Ranks	Comments
Complexity in design and non-involvement of expert.	0.84	1	***H.S
Use of poor quality component and materials.	0.78	2	**S
Natural deterioration due to age and environment	0.77	3	S
Absence of planned maintenance	0.72	4	S
No effective maintenance due to	0.69	5	S
Lack of skilled manpower to maintenance work in building	0.68	6	S
Frequent shortage of material and spare part	0.67	7	S
The scale of effort, extent of facilities and resource of maintenance operation	0.66	8	S
Persistent breakdown through indiscipline and ignorance	0.66	8	S
Reluctance of some establishments to innovation support	0.65	10	S
Procuring of spare part becomes difficult.	0.62	11	S
Attitude of the Public and mis-use of facilities	0.62	11	S
No adoption of appropriate maintenance cycle for hospital.	0.55	13	*N

*** Highly significance, ** Significance, * Neutral, ^ Mean item score

Table 4 shows the important rating of causes of lack of maintenance responsibilities. Complexity in design and non-involvement of expert is highly important, use of poor quality component and materials, natural deterioration due to age and environment, absence of a firm of planned maintenance program, no effective maintenance due to de-emphasis on training, lack of skilled manpower to maintenance work in building, frequent shortage of material and spare part, the scale of effort, extent of facilities and resource of maintenance operation, persistent breakdown through indiscipline and ignorance, reluctance of some establishments to innovation support, procuring of spare part becomes difficult and attitude of the public and mis-use of facilities are shown to be important and no adoption of appropriate maintenance cycle for hospital building is on a neutral level meaning that it is neither significant nor insignificant.

It was postulated that there is no significant relationship between the identified level of significance of causes of lack of maintenance responsibilities by maintenance staff and construction professionals.

Alternatively, there is significant relationship between the identified level of causes of lack of maintenance responsibilities by maintenance officials and construction professionals.

Table 4: Reason for neglect of maintenance in public hospital building

Reasons for lack of maintenance culture in public hospital buildings	Mean X	Mean Z
Attitude of the Public and mis-use of facilities.	4.24	2.48
Procuring of spare part becomes difficult.	3.9	2.48
Persistent breakdown through indiscipline and ignorance	3.96	2.64
Reluctance of some establishments to innovation	4.24	2.60
The scale of effort extent of facilities and resource of maintenance operation	4.24	2.64
No effective maintenance due to lack of emphasis on training	4.56	2.76
Natural deterioration due to age and environment	4.40	3.08
Frequent shortage of material and spare part	4.12	2.68
Lack of skilled manpower to maintenance work in building design construction.	3.60	2.72
Use of poor quality component and materials	4.04	3.12
Absence of planned maintenance programme	3.96	2.88
Complexity in design and non-involvement of expert.	4.12	3.36
No adoption of appropriate maintenance cycle for hospital building	3.88	02.2

From Table 5: X represents Maintenance staff, Z represents Construction consultants

$r_{sc} = 0.226$, $r_{sc\text{ critical}} = 0.5604$, $d.f = 12$, $\alpha = 0.05$

$r_{sc} < r_{sc\text{ critical}}$, consequently the null hypothesis that there is no significant relationship between the identified level of causes of lack of maintenance responsibilities by maintenance officials and construction consultants is upheld

State Of Maintenance In Public Hospital Built Environments.

It was postulated that there is no significant difference in the state of maintenance identified by maintenance officials and

users of public hospital buildings.

Alternatively, there is significant difference in the state of maintenance identified by maintenance officials and users of public hospital buildings

Table 5: State of maintenance in public hospital buildings

State of maintenance in public hospital buildings	X1	X2
Staff sufficiency	1.96	2.32
Maintenance strategy	2.60	1.24
Maintenance policy	2.12	1.48
Inspection of built environment	2	1.88
Frequency of inspection	2.6	2.92
Training programme	1.2	1.12
Handling capacity of maintenance works	1.52	1.36
Effectiveness in handling of maintenance works	1.72	2.48
Performance rating of electrical generating set	3.16	3.12
Performance rating of Pumping machine	2.88	2.80
Performance rating of cooling units	2.84	2.60
Performance rating of water heating equipment	2.92	2.64
Safety of hospital building against fire outbreak	1.00	2.00
Prevention against breakage and burglar	2.00	1.92
Adequacy of precautionary measures	2.00	2
Total	32.52	31.88

From Table 9: X1 represents maintenance staff, X2 represents users of public hospitals.

$t_{cal} = 2.82$, $t_{tab} = 1.70$, $d.f = 14$, $\alpha = 0.05$

$t_{cal} > t_{tab}$, consequently the alternative hypothesis that there is significant difference in the state of maintenance identified by maintenance officials and users of public hospital buildings is upheld.

Discussion of Findings

Responses from the questionnaire administered on maintenance staff of public hospital buildings and construction professionals revealed the causes of neglect of maintenance responsibilities of public hospital buildings in the order of importance. Maintenance staff identified causes in the following descending order; no effective maintenance due to lack of emphasis on training, natural deterioration due to age and environment, lack of support for innovation, the scale of effort, extent of facilities and resource of maintenance operation, attitude of the public and mis-use of facilities, complexity in design and non-involvement of expert, frequent shortage of material and spare part are highly significant while use of poor quality component and materials, persistent breakdown through indiscipline and ignorance, absence of planned maintenance programme, procuring of spare part becomes difficult, no adoption of appropriate maintenance cycle for hospital building and lack

of skilled manpower to maintenance work in building design and construction are significant.

The construction professionals identified complexity in design and non-involvement of expert as a very important factor in the neglect of maintenance responsibilities of public hospital buildings. Furthermore, it is revealed that use of poor quality component and materials, natural deterioration due to age and environment, absence of planned maintenance programme, no effective maintenance due to lack of emphasis on training, lack of skilled manpower to maintenance work in building design and construction, frequent shortage of material and spare part, the scale of effort, extent of facilities and resource of maintenance operation, persistent breakdown through indiscipline and ignorance, lack of support for innovation, procuring of spare part becomes difficult and attitude of the public and mis-use of facilities are all important

factors that should be taken into consideration in avoiding occurrence of lack of maintenance responsibilities in public hospital built environment. Non-adoption of appropriate maintenance cycle for hospital building is on a level of importance meaning that it is neither significant nor insignificant.

Although there is no significant relationship between the identified level of causes of neglect of maintenance responsibilities by maintenance staff and construction professionals, it is confirmed that both groups identified complexity in design and non-involvement of expert to be highly important and use of poor quality component and materials, persistent breakdown through indiscipline and ignorance, absence of planned maintenance programme, procuring of spare part becomes difficult and lack of skilled manpower to maintenance work in building design and construction are important.

It is discovered that there is significant difference in the state of maintenance identified by maintenance staff and users of public hospital buildings. This could imply that either the maintenance staff is trying to protect their interest or the users are not appreciating the effort of the maintenance department.

Recommendations

Public hospital building should be seen as a great asset to the nation that must be adequately protected and maintained by government, users and the communities. The built environment of the public hospital building should be such that the approach to its maintenance culture should encourage more innovation and adequately understood by its maintenance officials. Users of the public hospitals should be given orientation about the built environment and how to relate with the it. Public hospital buildings should also be given attention by the government by providing adequate funds in carrying out maintenance at any point in time. The community it serves should in return supports its existence and the people patronizing it. Public hospitals should be seen as an institution that affects all.

Conclusion

This study has been able to identify various factors that cause neglect of maintenance in order of their importance. Knowing the importance rating of these factors would help the government, users and maintenance officials to be aware of the problems militating against maintenance responsibilities of hospital buildings and in light of these measures shall be taken against allowing these factors to occur and controlling the factors when they eventually occurred.

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