

# Assessment of Maintenance Practices in Health Care Institutions in Ghana; A Study of Bekwai Municipal Hospital

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## ABSTRACT

**Purpose** – The study aims to assess the maintenance practices in the Bekwai Municipal Hospital. The study specifically assessed the availability of a maintenance policy, the maintenance strategy used, and the current state of buildings in the hospital.

**Design/methodology/approach** – The study adopted a descriptive research design. A sample size of 108 respondents was selected using simple random and purposive sampling techniques. Questionnaires and observation checklists were used to collect data for the study.

**Findings** – The Bekwai Government Hospital has a maintenance policy and uses a corrective maintenance strategy. Maintenance works are performed only upon request, which are acted upon approximately within one month. Users (staff) of hospital facilities generally made maintenance requests verbally. Generally, the buildings in the hospital were in a good state of repair.

**Practical Implications** – The paper underscores the importance of efficient maintenance practices in Ghanaian healthcare institutions, as they significantly influence building conditions and effective healthcare delivery.

**Originality/ Value** – The study specifically focused on maintenance practices that could enhance the effective management and use of hospital facilities (buildings and other services).

**Keywords:** Maintenance Practices, Hospital Buildings, Facilities, Preventive Strategy, Corrective Strategy.

## INTRODUCTION

Maintenance, once seen as unavoidable, is now recognized globally as strategically important for most organizations (Fraser et al., 2015). In a healthcare environment, the availability, adequacy, and functionality of accommodation facilities are key factors in determining customer satisfaction. Evidence suggests that facilities services significantly affect customer satisfaction and employee productivity (Barrett & Baldry, 2009; Prince et al., 2011; Taiwo, 2010). Therefore, due to rapid technological advancements, the construction industry has developed an effective supporting services system to enhance service delivery and ensure long-term building functionality and profitable operation (Støre-Valen and Buser, 2019). However, implementing such an effective system provided by Facilities Management (FM) remains a significant obstacle (Jawdeh, 2013). According to the World Health Organization (2020), access to vital health

treatments has become more difficult, and hospital-acquired illnesses are more common. Adenuga (2012) observed that although healthcare structures (buildings) are where patient care is provided to every individual, these structures in recent years have become a place where staff and patients contract various forms of infections and allergies. In addition, Amos et al. (2020) observed that there has been an increase in poor healing conditions in hospitals and its associated healthcare infections. In terms of the effective provision of FM in these institutions, Oleribe et al. (2019) identified several challenges in the implementation of effective FM / maintenance practices including neglect and financial limitations, shortages in human resources, deficiencies in healthcare infrastructure, and a general lack of service quality in clinical healthcare. These challenges have been attributed to improper facilities/estate management practices, particularly maintenance. Studies in the service management literature have also investigated and affirmed the causal links between service quality, customer satisfaction, and performance (Amankwah et al., 2019a; Ikediashi et al., 2015; Koleoso et al., 2017). This indicates the Estate/FM maintenance practices must be given the necessary attention in healthcare institutions. Therefore, hospital facilities and estate management units are tasked with providing facility planning and hospitable soft services, in addition to any long-term strategic plans involving renovations, building, and lifecycle maintenance (Shirey et al., 2017). This further underscores the role maintenance can play in providing quality healthcare services. Amponsah-Kwatiah et al. (2021) observed that the maintenance culture in Ghana is notably poor and receives little priority. This could be attributed to the kind of maintenance practices used in these institutions. Amponsah-Kwatiah et al. (2021) further argued that this poor maintenance culture, especially in public institutions, has serious implications and consequences for buildings, which subsequently affect users. This study seeks to assess building maintenance practices in healthcare institutions in Ghana, especially the Bekwai Municipal Hospital. The study specifically assesses the availability of a maintenance policy, the type of maintenance strategy used, and the current state of buildings at the Bekwai Municipal Hospital.

## LITERATURE REVIEW

### Maintenance of Hospital Facilities in Ghana

According to Lennerts et al. (2005), hospitals are exceptionally sensitive facilities and constitute one of the most complex areas of facilities management. Due to their multifaceted nature, even a single error in a hospital can have fatal consequences. Consequently, hospitals are expected to consistently operate at peak efficiency. Jandali and Sweis (2018) emphasized the critical importance of maintaining the functionality of hospital facilities and buildings. They argued that this importance cannot be overstated, given the potential for significant damage resulting from minor or major maintenance difficulties if hospitals were to close. Good patient care is contingent not only on dedicated staff but also on the physical structures of these facilities and the hospital environment, which must promote the well-being and safety of patients (Adenuga, 2012). A well-planned maintenance strategy can enhance comfort, energy efficiency, occupant health and safety, and the surrounding environment, resulting in higher user satisfaction (Herman, 2011). Atinga et al. (2011) concluded that challenges associated with maintaining health facilities in Ghana are attributed more to the lack of facilities management rather than a maintenance culture. On their part, Au-Yong et al. (2019) observed that building maintenance difficulties have increased in recent years, especially in aging buildings. For instance, Faqih et al. (2020) found that the average lifespan of constructed buildings, including hospital and service buildings, is 50 years. However, due to poor maintenance practices, buildings in healthcare institutions are often in a state of disrepair. Another issue is the lackadaisical attitude of stakeholders toward maintenance (Sharma et al., 2019), leading to the deterioration of public buildings. Although this may not immediately impact occupants' lives, it remains a concern. Adejimi (2005) and Amankwah et al. (2017b) reiterated that while poor facility operation is commonly linked to insufficient maintenance management practices, it remains debatable whether certain unique flaws in buildings can be attributed to specific inappropriate conditions during the design, construction, and operational phases of the building.

## Development and Sustainability of Healthcare Facilities

The primary objective of facilities management is to achieve and promote sustainable development with in the country. Ortiz et al. (2009) contend that continuous improvement of building facilities is achieved when there is an enhancement in the quality of life without compromising the quality of life for future generations. To attain exceptional sustainability performance and gain shareholder approval, it is imperative that the buildability, maintainability, and sustainability of buildings are meticulously considered from inception to completion. According to Mbamali (2005), buildability relates to how effectively a building's design translates onto the ground, minimizing potential defects in alignment with the overall project requirements. Achieving buildability necessitates considering various factors, which may vary by location, during the initial design phase. Such factors may include disparities in site conditions, climatic considerations, existing construction expertise, and the availability of supplies, equipment, and skills (Ly, 2015). Chahal and Mehta (2013) and Amankwah et al. (2017b) have observed that the maintainability of any facility, particularly in the case of hospitals, becomes evident through the physical maintenance of the structure and service quality. This involves creating pleasant environments, arranging bed layouts efficiently, equipping rooms adequately, ensuring hygienic washrooms and lavatories, and strategically placing dustbins in corridors to enhance patient satisfaction. Atinga et al. (2011) reaffirmed that ensuring and upholding quality service in hospitals leads to meeting and surpassing patient expectations and elevating the morale of healthcare providers and patients, consequently enhancing the overall value of roles performed within the hospital. Numerous stakeholders share concerns about this matter, and if not addressed properly, issues with hospital building maintenance procedures may hinder the development of benchmarks for external evaluation programs related to hospital infrastructure (Sharma et al., 2019). Sustainability efforts in the healthcare sector should strive to create serene healthcare environments through effective maintenance management, establish improvement objectives and best practices within hospitals, and foster competition and innovation. To achieve sustainability, the primary goals should center around achieving ideal service quality and user satisfaction, aligning with both customer and hospital standards.

## Maintenance of Health Institutions

Maintaining healthcare institutions is of utmost importance as it directly impacts the quality of care provided to patients. There is no single conventional approach to maintenance management systems that has been universally achieved (Lennerts et al., 2005). In other words, no singular structured method with policies and procedures guarantees an optimal maintenance system (Koleoso et al., 2017). Organizations with similar products often have different technological advancements and production sizes and may apply different maintenance systems successfully. Therefore, factors such as experience and judgment may inform the design of a maintenance system, which may be supported by several formal decision tools and techniques (Shirey et al., 2017). Nevertheless, the structural framework supporting maintenance and planning day-to-day maintenance tasks are two vital concerns that should not be compromised. As Lennerts et al. (2005) point out; hospitals are highly sensitive facilities and represent one of the most complex areas within facilities management. Due to their multifaceted nature, even a single error in a hospital can have fatal consequences, which is why they are expected to consistently operate at peak efficiency. Interestingly, the state of healthcare facilities and the backlog of deferred maintenance can be attributed partly to the maintenance practices employed by state departments (Amankwah et al., 2017b). Public facilities, especially hospitals, often find their buildings neglected because preserving or maintaining existing structures requires planning and can be costly (Chahal and Mehta, 2013). Maintenance culture is a combination of two words: maintenance, defined as the process of retaining or restoring an item or facility to a standardized operable condition to achieve its maximum useful life, and culture, which refers to a particular people's ideas, customs, and societal behaviour. In light of these definitions, maintenance culture can be described as the set of activities necessary to retain or restore a facility to a specified operable status to achieve its maximum useful life, carried out by a group of individuals sharing common beliefs, customs, and societal behaviours

related to the execution of these necessary actions. A significant issue arises from the imbalance or neglect of public agency managers, who often fail to prioritize the maintenance and repair of public buildings and instead allocate insufficient funding (Ortiz et al., 2009).

## **METHODOLOGY**

The study adopted a descriptive research design. This research design aims to systematically obtain information to describe a phenomenon, situation, or population (Saunders et al., 2009). In this case, it stands to give a systematic assessment of the maintenance practices of the Ghanaian health sector. The study population comprised the staff (clinical and estate) of Bekwai Hospital who are involved in the use of the facilities and are aware of the maintenance practices in the hospital. The main reason for using these categories of people is that their activities directly or indirectly interact with the hospital's facilities and are familiar with the activities occurring within the facilities. Yamane's (1967) mathematical formula was used to determine the sample size for clinical and estate staff categories. With a confidence level of 95%, a 5% margin of error, and a population of 148 people, a sample size of 108 respondents was determined. In relation to the confidence interval, Young and Bolton (2009) argued that a ninety-five percent confidence interval is the maximum suitable interval. Regarding the perspective of the estate staff: the estate manager, maintenance supervisor, one (1) electrician, one (1) plumber, one (1) carpenter, one (1) air-conditioner technician, and the headman of the cleaners were selected due to their resourcefulness with the subject understudied.

Therefore, simple random (clinical staff) and purposive (estate staff) sampling techniques were used to select the respondents. The study used both primary and secondary data. The primary data was collected from respondents (mainly staff) at the health facility, and secondary data were obtained from the maintenance reports from the hospital. Questionnaires were used as the data collection tools. Generally, the questionnaire was designed to obtain data from the clinical staff and the estate staff of the Bekwai Hospital. The questionnaire contained five sections and covered the following categories: the demographic characteristics of the respondents, respondents' knowledge of maintenance practices, the current state of the facility, the practices of the maintenance regime adopted, and suggestions for the effective management of these facilities. Observation was also used to assess some physical elements of the hospital building/facilities. To ensure validity and reliability, content validity (through expert judgement) was used to assess the content of the questionnaire with the assistance of the estate manager and two clinical staff. The estate manager is considered an expert in the area of estate maintenance, whereas the clinical staff are considered as the core staff who use the facilities of the hospital in the direct provision of healthcare, hence, their feedback was sought on the relevance, clarity and comprehensiveness of the items. Data from the field were analyzed descriptively and presented using descriptive statistical tools. One hundred and eight (108) questionnaires were retrieved from the respondents, representing a 100% response rate. Data from the respondents were coded and analyzed using the Statistical Package for Social Science (SPSS) software version 24 and presented using descriptive tool such as bar graphs, pie charts, and tables.

## **RESULTS AND DISCUSSION**

This section presents and discusses the data that has been collected. The results are presented using tables and graphs where appropriate. This section is structured into sub-headings to enhance clarity, facilitate easy understanding of the result, and relate the data obtained to the study's objectives.

### **Respondents' Demographic Characteristics**

Information on the respondents' demographics has been discussed in Table 1.

**Table 1: Demographic Characteristics of the Respondents**

Variable	Description	Frequency	Percent
Sex	Male	40	37.04
	Female	68	62.96
Age	Less than 25	20	18
	25 to 35	47	44
	36 to 45	24	22
	Above 45	17	16
Job position	Estate Manager	1	0.92
	Maintenance Supervisor	1	0.92
	Electrician	1	0.92
	Plumber	1	0.92
	Carpenter	1	0.92
	Air-conditioner Technician	1	0.92
	Headman of Cleaners	1	0.92
	Clinical staff	101	93.5
Work experience	Below a year	21	19.4
	From 1 to 2	32	29.6
	From 3 to 5	22	20.4
	More than 5 years	33	30.6
Level of education	Ph.D	0	0
	Master's degree	17	15.7
	First degree	54	50
	Diploma/certificate courses	37	34.3
<b>Total</b>		<b>108</b>	<b>100.0</b>

**Source: Researcher's Field Survey 2022**

A total of 21 (19.4%) respondents have spent less than one year within the Bekwai Hospital. Exactly 32 (29.6%) have spent between 1-2 years within the Hospital, while 22 (20.4%) respondents have spent between 3 to 5 years, and 33 (30.6%) respondents spent more than 5 years at the Bekwai Hospital (see Table 1). This indicates that majority (30.6%) of the respondents have worked in the institution for a considerable number of years and were therefore considered knowledgeable in relation to the maintenance practices at the Hospital. This also enabled the study to obtain meaningful and credible data from the respondents.

The demographic information from the respondents (see Table 1) indicates that none of the respondents



holds a Ph.D., but 17 (15.7%) respondents hold second or master’s degrees as their highest qualification. The majority, 54 (50%) of the respondents, hold a bachelor’s degree as their highest qualification, while 37 (34.3%) have a diploma as their highest qualification. This implies that most of the working class in the hospital are first-degree holders, primarily young individuals, and they work at the operational levels within the hospital. Staff with a diploma or certificate are responsible for handling the tactical level of operations in the hospital, overseeing day-to-day operations to ensure efficiency and effectiveness.

**Availability of a Maintenance Policy**

Moya (2014) observed that a maintenance policy is a set of administrative, technical, and managerial actions to apply during the life cycle of facilities. A maintenance policy often consists of instructions, methods, and best practices for maintaining infrastructure, machinery, or equipment securely, effectively, and economically. Its purpose is to guide decisions in maintenance management towards retaining specific facility operating conditions or dedicated to restoring the facility to said conditions. The study sought to determine whether the hospital had a maintenance policy to guide its facilities management activities. Data were thus obtained from the clinical staff and estate staff category of respondents (see Table 2).

**Table 2: Availability of Maintenance Policy**

CLINICAL STAFF			ESTATE STAFF		
Response	Frequency	Percent	Response	Frequency	Percent
Yes	38	37.6%	Yes	7	100%
No	33	32.7%	No	0	0
Don’t know	30	29.7%	Don’t know	0	0
<b>Total</b>	<b>101</b>	<b>100%</b>	<b>Total</b>	<b>7</b>	<b>100%</b>

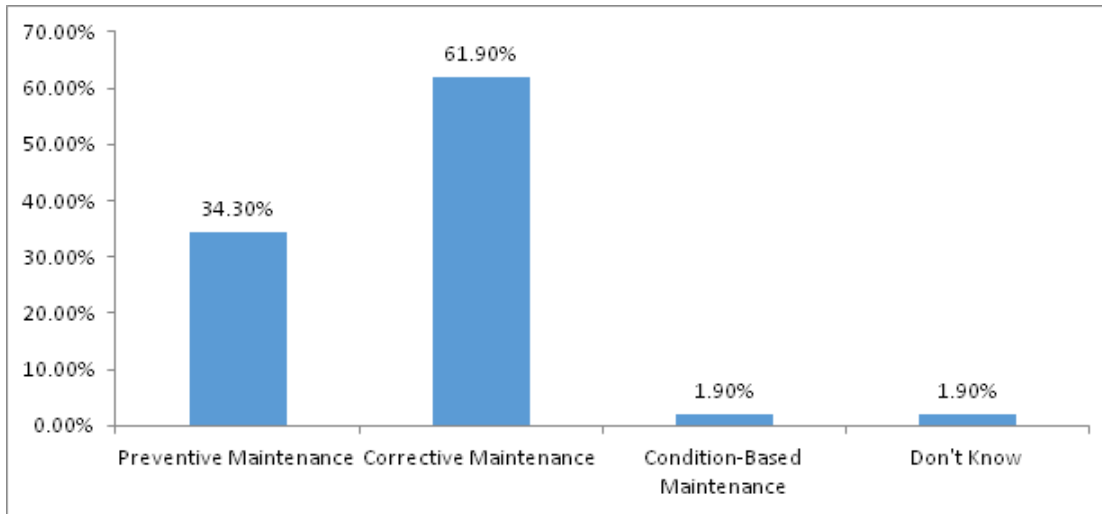
**Source: Researcher’s Field Survey 2022**

Data from the field (38 [37.6%]) indicates that the hospital has a maintenance policy (Table 2). However, 33 (32.7%) respondents said the hospital does not have a maintenance policy and 30 (29.7%) indicated they do not know if the hospital has a maintenance policy. This is because the technical staff in the estate department are using the maintenance policy of the hospital and there is no constant training as to whether their practice is in line with the policy. As a result, the staff who are not technical personnel are not aware of the maintenance policy in the hospital.

On the other hand, all the 7 estate staff sampled representing 100%, indicated that the Hospital has a maintenance policy. It can, therefore, be established that the majority (a little over half) of the staff respond in the affirmative with regard to the existence of a maintenance policy. This positive response by all the estate staff sampled implies that the hospital has a maintenance policy. However, the hospital management must ensure that information on certain crucial policies, such as the maintenance policy, is available to other staff of the hospital. This is because a maintenance policy is critical in organizational maintenance management. In terms of the importance of a maintenance policy. It was found that it helps to guide the maintenance department with a specific emphasis on maintenance planning and actions in the Hospital. This corroborates the findings of Moya (2014) in relation to the importance of maintenance policies.

### Types of Maintenance Adopted at the Bekwai Municipal Hospital

The staff were asked to state the maintenance strategy/type adopted (see Figure 1).



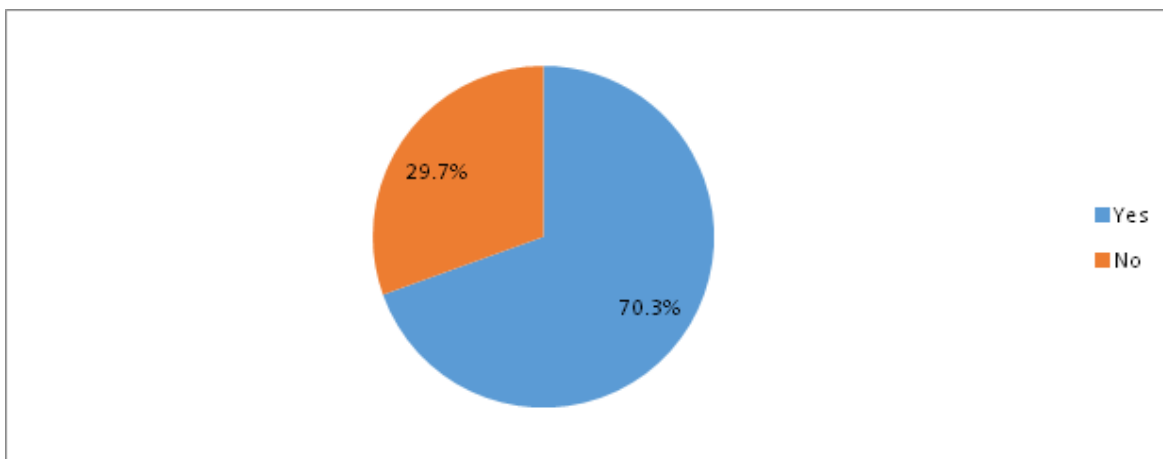
**Figure 1: Type of Maintenance Adopted**

**Source: Researcher’s Field Survey 2022**

In terms of the types of maintenance adopted by the hospital, 2 (1.9%) indicated that condition-based maintenance was used, and 67 (61.9%) also indicated that corrective maintenance was adopted. However, 37 (34.3%) respondents opined that the hospital uses preventive maintenance. In addition, 2 (1.9%) respondents did not know the strategy used by the hospital. Therefore, the exact maintenance approach being used at the hospital is challenging. However, one can infer that corrective maintenance is the type or approach used by the hospital since majority (62%) of the respondents indicated that was the type of maintenance adopted by the hospital.

### Inspection of Hospital Buildings by Maintenance Department

To provide insight into the nature of the maintenance strategy adopted by the Bekwai Hospital, the sampled clinical staff was asked if the maintenance department conducted regular inspections of the hospital buildings (see Figure 2).



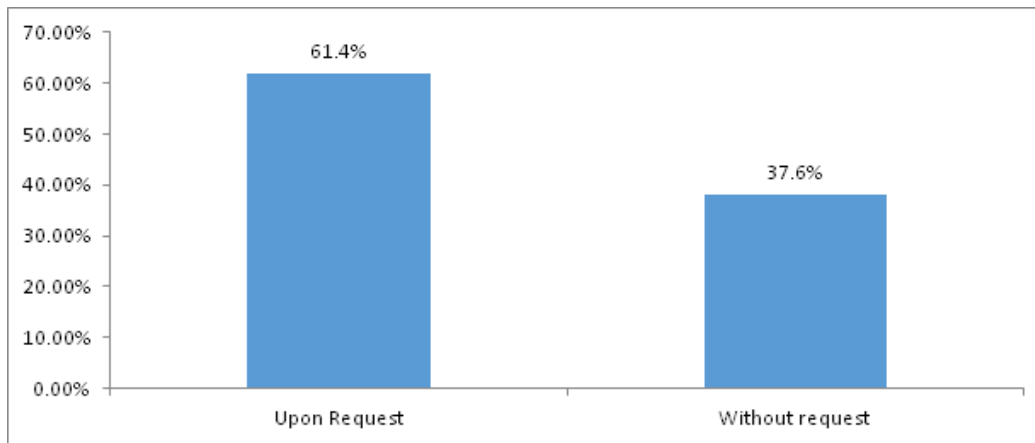
**Figure 2: Inspection of Hospital Buildings by Maintenance Department**

**Source: Field Survey (2022)**

Data from the field (see Figure 2) revealed that 30 (29.7%) of the 101 clinical staff indicated that the institution undertook a regular inspection of buildings, and 71 (70.3%) also indicated that inspection of hospital facilities/buildings was not done regularly. This is because there is no maintenance schedule for the hospital showing the time interval that building inspections should be carried out in the hospital.

### Necessary Conditions for maintenance works

The study collected data from the respondents in relation to how maintenance works are initiated at the Hospital. It sought to determine whether maintenance works were performed solely upon request (see Figure 3).



**Figure 3: Necessary Conditions for maintenance works**

**Source: Researcher’s Field Survey 2022**

Regarding the management of maintenance works, 62 (61.4%) respondents said maintenance work was performed upon request. In comparison, 38 (37.6%) respondents indicated that maintenance works were performed without a request. On the part of the estate staff, 6 respondents observed that maintenance works were carried out upon request, and 1 respondent indicated that maintenance works were done without request. This is done at the estate staff routine inspection. When they see the need for maintenance in a particular building, they undertake the maintenance actions without request. This is in congruence with the data obtained from the clinical staff on whether or not maintenance works were performed without request.

### Mode of Reporting Maintenance Issues

The study also collected data from the clinical staff concerning the mode of reporting maintenance issues. A total of 101 responses were obtained (see Table 3).

**Table 3: Mode of Reporting Maintenance Issues**

Mode of reporting	Frequency	Percent
Complete Form	25	24.8
Report Verbally	60	59.4
Phone call	16	15.8
<b>Total</b>	<b>101</b>	<b>100.0</b>

**Source: Researcher’s Field Survey (2022)**



It was revealed that 25 (24.8%) respondents lodged their complaints by completing a ‘report form.’ Also, 60 (59.4%) respondents complained by reporting verbally, and another 16 (15.8%) respondents also noted that their complaints about maintenance issues were made through phone calls to the appropriate unit (see Table 3). Therefore, reporting complaints in the health facility was largely done verbally. This also has its consequences on reports made.

The maintenance personnel also responded to how they received complaints regarding maintenance issues in the facility. A total of 7 responses were obtained. Specifically, 6 respondents indicated that maintenance complaints were received verbally, and 1 respondent mentioned that complaints were received via phone call. It is clear from the analysis that the maintenance complaints in the study hospital were largely made verbally and received verbally in the hospital from the perspective of both parties studied. However, since verbal issues were not recorded, it affected the promptness of the response to maintenance issues in the facility.

The study further assessed the time it takes maintenance requests to be attended to (see Figure 4).

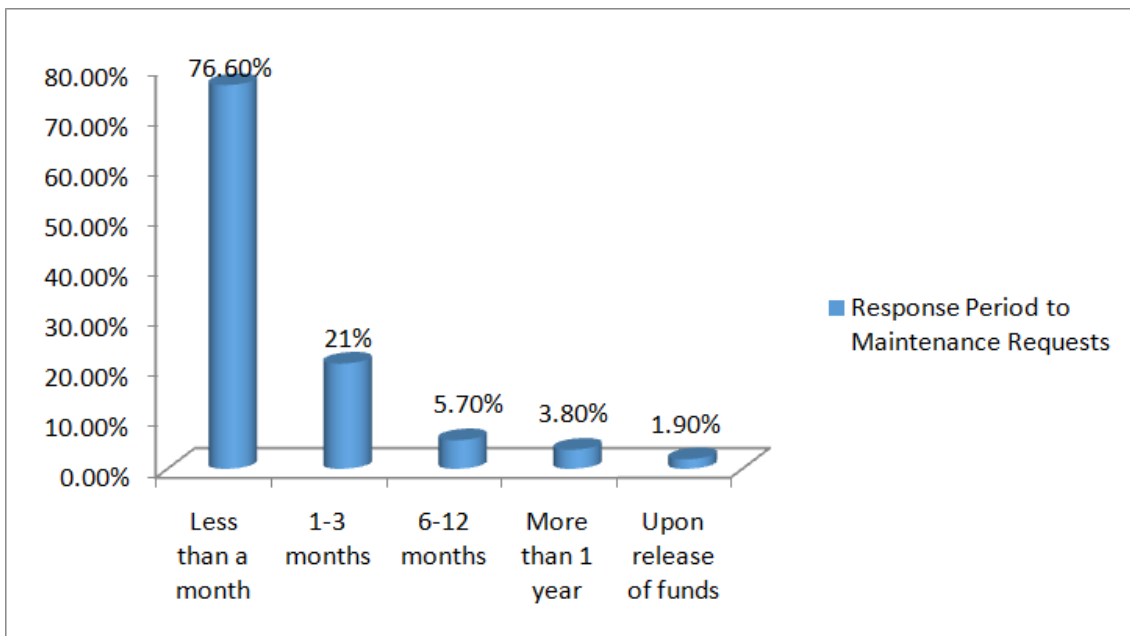


Figure 4: Response Period to Maintenance Requests

**Source: Researcher’s Field Survey 2022**

It can be established that their maintenance requests take less than a month to be attended to (see Figure 4). Generally, the staff (facilities users) largely argued that the maintenance unit took less than one to respond to their requests. However, respondents could not state the exact time since the questionnaire did not make that provision for them. The estate staff also responded to the same question from their perspective. However, there were conflicting responses from the estate office, which should work together using the same guidelines. Out of 7 respondents, six (6) respondents indicated that they responded to complaints between 1-2 weeks, and only one (1) respondent indicated a 1-month response period for requests made and advanced that this longer time was due to delay in the release of funds. Therefore, maintenance response was hinged upon the release of funds. It is therefore clear that maintenance staff capacity coupled with the unavailability of funds to undertake maintenance were the major issues that influenced the response to maintenance issues in the facility.

### Condition of Hospital Buildings

To assess the conditions of the hospital buildings respondents from the clinical staff category were asked to assess the condition of some elements of the hospital buildings, namely roofs, floor finishing, walls, painting, windows and doors, electrical installations, and plumbing installations since the largely interacted with the facilities daily (see Table 4). The result is presented and discussed under the subsections corresponding to the assessed elements.

**Table 4: Conditions of hospital buildings**

Condition	Frequency	Percent
<b>Roofing</b>		
Leakage	30	29.7
Rusty	43	42.6
Partly ripped off	3	3
Completely ripped off	2	2
No defect	13	12.8
Rusty and partly ripped off	2	2
Leakage and rusty	8	7.9
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Floor finish</b>		
Cracks	35	34.6
Peeled-off defect	5	5
No defect	61	60.4
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Walls and painting</b>		
Cracks developed	70	69.3
Peeled-off Painting	9	8.9
No defect	22	21.8
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Windows and doors</b>		
Completely broken	2	2
Partly broken	60	59.4
No defect	39	38.6
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Condition of electrical installations</b>		
Faulty	52	51.5
No defect	49	48.5
<b>Total</b>	<b>101</b>	<b>100.0</b>
<b>Plumbing Installation</b>		
Broken down	3	3
Leaking	50	49.5
No defect	48	47.5
<b>Total</b>	<b>101</b>	<b>100.0</b>

Source: Researcher's Field Survey 2022

In terms of roofing, 42.6% of clinical staff indicated that the roofs were rusty, 29.7% were leaking, 3% were partly ripped off, 2% were rusty and partly ripped off, 2% were completely ripped off, 7.9% were both leaking and rusty and 12.8% indicated that there was nothing wrong with the roofs (see Table 4). The study team observed that some of the roofing materials for the hospital buildings were rusty. However, the rusty nature of the roofing can be attributed to weather effects over time, but it may not have any negative effect on the functionality of the roofing currently. On issues of the floor finishes, 60.4% of the respondents indicated that the floor screed of the hospital buildings had no defect, whereas 34.6% and 5% said there were cracks and peeled-off defects, respectively (see Table 4). Generally, it can be established that the floor finishes were in good condition. In terms of the state of the walls and painting, data from the field revealed that 78.2% of the clinical staff believed that the walls had defects, whereas 21.8% said that the walls had no defects and were in good condition. It was observed that some of the walls had developed cracks. Therefore, based on the researcher’s observation and the modal response of the clinical staff, it can be inferred that the walls needed maintenance.

Windows and doors are also very crucial components of a building. Therefore, concerning the condition of windows and doors, 59.4% of the respondents indicated that some were either partly or completely broken. In addition, 38.6% of the respondents stated that there were no defects with the doors and windows (see Table 4). An observation made by the study revealed that some of the windows had missing louvre blades while some louvre blades were broken. Some of the doors also had broken locks. Therefore, based on the respondents’ opinions and the authors observations, it can be implied that the windows and doors in the health facility were not in a good state of repair, which raised concerns, and this had a general implication on the condition of the hospital facilities.

In terms of the electrical installations, there were mixed views as to the condition or current state of the electrical installations of the Hospital. Indeed, opinions were almost equally divided on the issue. Over half (51.5%) of respondents indicated that the electrical installations were faulty and needed attention. In comparison, 48.5% said there were no defects (see Table 4). The data obtained here is inconclusive regarding the conditions of the electrical installations at the Bekwai Hospital.

About plumbing installations, there were also mixed views as to the condition of the current state of plumbing installations in the hospital. Like the electrical installations, opinions were also almost equally divided on the issue. (47.5%) of the respondents indicated no defects with the plumbing system. In comparison, 49.5% of them said that the plumbing system had leakages with only 3% of the respondents indicating a complete breakdown of the system. This means that about 52.5% of respondents indicated some defects with plumbing installations at the Bekwai Hospital whereas 47.5% indicated no defects. One can conclude that there were largely some defects with the plumbing installations at the health facility.

### General Condition of Hospital Buildings

To ascertain the general conditions of the hospital facilities, respondents from the clinical staff category were asked to assess the general condition of the hospital facilities (see Table 5).

**Table 5: General Maintenance Condition of Hospital Buildings**

Condition	Frequency	Percent
Well-maintained	81	80
Poorly maintained	20	20
<b>Total</b>	<b>101</b>	<b>100.0</b>

**Source: Researcher’s Field Survey 2022**

Out of a total of 101 respondents obtained from the clinical staff, 80% of them indicated that the hospital facilities were well maintained. In contrast, 20% of the respondents indicated that the hospital facilities were not well maintained. Generally, from the study, there is a gap in relation to the maintenance of the hospital's facilities, which may have negative implications for the provision of hospital services to patients. It is therefore crucial to provide a conducive environment for the provision of healthcare services to patients or clients of this Hospital. This will go a long way to enhance the provision of healthcare services in Ghana's healthcare sector.

## CONCLUSION AND RECOMMENDATIONS

The study aimed to assess maintenance practices in the Bekwai Municipal Hospital. It specifically assessed the availability of a maintenance policy, the type of maintenance strategy used, and the current state of the hospital's buildings. It was found that Bekwai Municipal Hospital has a maintenance unit, and its maintenance activities are guided by a maintenance policy. The study observed that the hospital's estate staff regularly inspected its buildings and facilities and followed a corrective maintenance approach. However, maintenance tasks were carried out solely upon request, with an average response time of approximately one month. All the buildings in the hospital were also in a good state of repair.

Furthermore, maintenance requests or complaints were predominantly communicated verbally. In light of the overall findings and drawing inferences from the field data, the study concludes that the hospital facilities were adequately maintained. However, the paper recommends the adoption of a preventive maintenance strategy to mitigate the rate of deterioration of the hospital facilities. This would necessitate allocating funds for maintenance-related activities. The maintenance unit should proactively fulfill its duties by intensifying regular inspections of hospital facilities, thereby addressing minor maintenance issues before they escalate.

Additionally, it is essential to educate hospital staff about the hospital's maintenance policy, ensuring they are well informed about the roles and responsibilities of the maintenance department regarding facility upkeep. Regarding implications, this study offers valuable insights into improving healthcare facilities maintenance and creating a conducive environment for healthcare services. Hospitals and healthcare institutions should prioritize the management of their built environment and facilities as they play a critical role in these establishments. In terms of research implications, it's worth noting that this study focuses solely on maintenance practices and how users perceive the condition of hospital buildings. Future research could explore how the state of hospital buildings and facilities impacts the healing process of patients. Additionally, assessing the competencies of estate and facilities managers responsible for healthcare institutions could help determine the qualifications and expertise required for effective estate management practices within these institutions.

## REFERENCES

1. Adejimi, A. (2005). Poor building maintenance in Nigeria: Are architects free from Blame? ENHR International Conference on "Housing: new challenges and innovations in tomorrow's cities."
2. Adenuga, O. A. (2012). Maintenance management practices in public Hospital built environment: Nigeria case study. *Journal of Sustainable Development in Africa*, 14(1), 185-200.
3. Amankwah, O., Choong, W. W., Abdul, H. M., & Maizan, B. (2017b). A Review of Sustainable Maintenance Management of Public Healthcare Facilities in Developing Countries: The Case of Ghana.
4. Amankwah, O., Choong, W.W., & Mohammed Abdul, H. (2019a). Modelling the influence of healthcare facilities management service quality on patients' satisfaction. *Journal of Facilities Management*, 17(3), 267-283.

5. Amos, D., Musa, Z.N., & Au-Yong, C.P. (2020). Performance measurement of facilities management services in Ghana's public hospitals. *Building Research and Information*, 48(2), 218-238.
6. Atinga, R. A., Abekah-Nkrumah, G., & Domfeh, K. A. (2011). Managing healthcare quality in Ghana: a necessity of patient satisfaction. *International Journal of Health Care Quality Assurance*, 24(7), 548–563.
7. Au-Yong, C.P., Ali, A.S., & Chua, S.J.L. (2019). A literature review of routine maintenance in high-rise residential buildings: a theoretical framework and directions for future research. *Journal of Facilities Management*, 17(1), 2-17.
8. Barrett, P., & Baldry, D. (2009). *Facilities Management Towards Best Practices*. Wiley-Blackwell.
9. Chahal, H., & Mehta, S. (2013). Developing patient satisfaction construct for public and private health care sectors. *International Journal of Pharmaceutical and Healthcare Marketing*, 7(1), 75-92.
10. Moya, M.D.C. (2014). MCDA Techniques in Maintenance Policy Selection. In *Encyclopedia of Business Analytics and Optimization* (pp. 12). DOI: 10.4018/978-1-4666-5202-6.ch13.
11. Faqih, F., Zayed, T., & Soliman, E. (2020). Factors and defects analysis of physical and the environmental condition of buildings. *Journal of Building Pathology and Rehabilitation*, 5(1). doi: 10.1007/s41024-020-00084-0.
12. Fraser, K., Hvolby, H. H., & Tseng, T. L. B. (2015). Maintenance management models: a study of the published literature to identify empirical evidence. *International Journal of Quality & Reliability Management*, 32(6), 635–664.
13. Lennerts, K., Abel J., Pfründer, U., & Sharma, V. (2005). Step-by-step process analysis for hospital facility management: An insight into the OPIK research project. *Facilities*, 23(3/4), 164-175.
14. Herman, P. J. (2011). Planned or Outcome-Based Maintenance Programs. *Facility Care Magazine*
15. Ikediashi, D.I., Ogunlana, S.O., & Odesola, I.A. (2015). "Service quality and user satisfaction of outsourced facilities management (FM) services in Nigeria's public hospitals." *Built Environment Project and Asset Management*, Vol. 5 No. 4, pp. 363-379.
16. Jandali, D., & Sweis, R. (2018). "Assessment of factors affecting maintenance management of hospital buildings in Jordan." *Journal of Quality in Maintenance Engineering*, Vol. 24 No. 1, pp. 37-60, doi: 10.1108/JQME-12-2016-0074.
17. Jawdeh, A.H.B. (2013). "Improving the integration of building design and facilities management." Unpublished PhD. A thesis submitted to the School of the Built Environment, College of Science and Technology, University of Salford, Salford, UK.
18. Koleoso, H.A., Omirin, M.M., & Adewunmi, Y.A. (2017). "Performance measurement scale for facilities management service in Lagos-Nigeria." *Journal of Facilities Management*, Vol. 15 No. 2, pp. 128-152.
19. Amponsah-Kwatiah, K., Owusu, S.A & Afranie, I. (2021). "An evaluative study of public property maintenance practices in a tertiary institution in Ghana." *Property Management* Vol. 39 No. 5, 2021, pp. 686-701.
20. Ly, H., Tongthong, T., & Peansupap, V. (2015). "Evaluating Importance Level of Buildability Factors in Cambodian Construction Projects." *Springer Science and Business Media*, 263-272.
21. Mbamali, I., Aiyetan, O. A., & Kehinde, J. O. (2005). "The building design for buildability: An investigation of the current practice in Nigeria." *Building and Environment*, 40(9), 1267-1274.
22. Oleribe, O.O., Momoh, J., Uzochukwu, B.S.C., Mbofana, F., Adebisi, A., Barbera, T., Williams, R. & Taylor-Robinson, S.D. (2019). "Identifying Key Challenges Facing Healthcare Systems In Africa And Potential Solutions." *International Journal of General Medicine*, 395-403, DOI: 10.2147/IJGM.S223882.
23. Price, M. F., Pitt, M., & Tucker, M. P. (2011). "Implications of a Sustainability Policy for Facilities Management Organizations." *Facilities*, 29(9/10), 391-410. <https://doi.org/10.1108/026327711111146314>.
24. Ortiz, O., Castells, F., & Sonnemann, G. (2009). "Sustainability in the construction industry: A review of recent developments based on LCA." *Construction and Building Materials*. 23, 28–39.
25. Saunders, M., Lewis, P., & Thornhill, A. (2009). "Research Methods for Business Students." Harlow: Pearson Education Limited.

26. Shirey, W.T., Sullivan, K.T., Lines, B. and Smithwick, J. (2017), “Application of lean six sigma to improve service in healthcare facilities management: a case study”, *Journal of Facility Management Education and Research*, Vol. 1 No. 1, pp. 9-18.
27. Sharma, V., Caldas, H.C. and Mulva, P.S. (2019), “Development of metrics and an external benchmarking program for healthcare facilities”, *International Journal of Construction Management*, doi 10.1080/15623599.2019.1573490.
28. Støre-Valen, M. and Buser, M. (2019), “Implementing sustainable facility management: challenges and barriers encountered by Scandinavian FM practitioners”, *Facilities*, Vol. 37 Nos 9/10, pp. 550-570, doi: 10.1108/F-01-2018-0013.
29. Taiwo, A. S. (2010). “The influence of work environment on workers’ productivity: A case of the selected oil and gas industry in Lagos, Nigeria.” *African Journal of Business Management*, 4(3), 299-307.
30. World Health Organization (WHO) (2020), “The work of the World Health Organization in the African Region report of the regional Director”, 1 July 2019–30 June 2020, available at: [www.afro.who.int/sites/default/files/202008/WHOAFRO\\_Regional%20Director%27s%20 Report%202019-2020\\_0.pdf](http://www.afro.who.int/sites/default/files/202008/WHOAFRO_Regional%20Director%27s%20Report%202019-2020_0.pdf) (accessed 21 May 2021).
31. Yamane, T., (1967), “Statistics: An introductory and analysis,” 2nd ed. New York: Harper and Row. (Retrieved from [www.worldcat.org](http://www.worldcat.org) on 22/10/2016).
32. Young, R. and Bolton, B., (2009). “Statistical literacy guides Confidence intervals and statistical significance.” London: Library of House of Commons. (Retrieved from [www. research briefings.files.parliament.UK](http://www.researchbriefings.files.parliament.UK))