

Institutional Related Factors Influencing Adherence to the American Heart Association Guidelines for Acute Coronary Syndrome Among Clinicians at Kenya Ports Authority Clinics in Mombasa, Kenya

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Abstract: Standard clinical guidelines like Advanced Cardiac Life Support by the American Heart Association are put in place to guide clinicians in the management of Acute Coronary Syndrome to improve the outcomes among the patients. The main purpose of the study was to assess the institutional related factors influencing adherence to the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. A descriptive cross-sectional study involving quantitative methods of data collection was adopted. An interviewer administered questionnaire was used for data collection. The target population was 106 clinicians attending to patients who present with Acute Coronary Syndrome at the KPA clinics in Mombasa. A Census method was used. Data analysis was done using Statistical Package for Social Sciences version 25 and presented in tables. Ethical approval was sought from Mount Kenya University Ethics and Research Committee (MKU-ERC) and permission was granted from the National Commission for Science, Technology and Innovation. The study concludes that the associations between availability ($p=0.000$), accessibility of the AHA guideline ($p=0.002$), training on ACS management ($p=0.022$) and provision of the resources ($p=0.004$) on adherence to AHA Guidelines among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya were significant. The study recommends that the KPA management should increase the medical budget to ensure the availability of adequate resources. The Clinic management should ensure that medications are readily available and accessible. The KPA Clinic management should formulate a simple algorithm that outlines the steps to be taken when managing ACS patients.

Keywords: Acute Coronary Syndrome, Adherence, American Heart Association Guidelines, Institutional Related Factors.

1. Introduction

Acute Coronary Syndrome (ACS) encompasses a spectrum of coronary artery diseases, including unstable angina, ST-segment-elevation myocardial infarction (STEMI), and non-ST elevation myocardial infarction (NSTEMI) (WHO, 2020). In 2020 WHO reported that cardiovascular diseases (CVDs) are

the leading cause of death globally. According to the World Health Organization (WHO) prediction (2004-2030), cardiovascular disease (CVD) will continue to be the leading cause of mortality globally up to 2030 (WHO, 2020).

Coronary artery disease is the second leading cause of death in both men and women in Europe, accounting for 21% and 22% of all deaths, respectively (Ralapanawa & Sivakanesan, 2021). Every sixth man and every seventh woman in Europe will die from myocardial infarction (MI) (Kakou-Guikahue et al., 2016). About 15.5 million Americans have coronary heart disease, with over 900,000 coronary events each year, which accrue over \$200 billion in direct and indirect costs (Mozaffarian 2016). In the United Kingdom (UK), there are over 80,000 hospital admissions with ACS annually (Weston, et al., 2017).

A prospective study conducted in Sub-Saharan Africa among 425 patients indicated that 13.5% of the patients were prevalent in ACS. About 71.5% of the patients prevalent with ACS had a final diagnosis of STEMI type and 28.5% of them were NSTEMI and in-hospital mortality was reported to be 10% (Kakou-Guikahue et al., 2016).

For the management of ACS, several guidelines exist, such as the National Institute for Health and Care Excellence (NICE) guidelines, the European Society of Cardiology (ESC) guidelines, and the American College of Cardiology/American Heart Association (ACC/AHA) guidelines. The ESC and ACC/AHA are the most known and comprise class I recommendations on acute in-hospital pharmacological treatment, risk stratification, performing coronary angiography (CA), and the prescription of discharge medications (WHO, 2020). Clinical Practice guidelines are used to guide clinical practice and disseminate information (Jones & Reeve, 2018).

Kenya is one of the countries in SSA experiencing a rapid demographic and epidemiological transition with a rising burden of NCDs such as CVDs, cancer, and diabetes (Maher,

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Ford and Unwin, 2018). In Kenya, cardiovascular diseases (CVDs) are responsible for much of the NCD burden, accounting for 25% of hospital admissions and 13% of deaths (Ministry of Health Kenya, 2016). In Kenya, the prevalence of hypertension was 23.8% and 8% of Kenyans have severe hypertension (Ministry of Health, Kenya, 2016). According to the National Stepwise Survey for NCDs carried out in 2015, in Kenya, hypertension is the most significant risk factor for CVDs (WHO, 2018). In 2018, the Ministry of Health launched the National CVD Guidelines as a key resource to improve the health outcomes of people living with heart diseases and equip health workers at all levels to prevent, treat and manage cardiovascular diseases and their risk factors. The guidelines cover the management of acute coronary syndrome which recommends the hospitals be well equipped and that all the health care workers attending to patients with ACS be ACLS trained (Ministry of Health, Kenya, 2018).

A. Problem Statement

Sub-Saharan African countries, including Kenya, are experiencing a rapid rise in the prevalence of heart diseases and their risk factors, including aging, hypertension, diabetes, obesity, physical inactivity and dyslipidaemia in the context of urbanization and globalization. The need to strengthen the health system in Sub-Saharan Africa is recognized by the World Health Organization (WHO). In Kenya, it is estimated that 25% of hospital admissions are due to CVD and 13% of autopsies revealed CVDs as the cause of death representing the second highest cause of death after infectious/maternal/perinatal causes. CVDs are costly to diagnose and manage leading to premature death among the most productive individuals in the household and the society. They are key contributors to poverty due to catastrophic health spending and high out-of-pocket expenditure (WHO, 2018). In 2019, the total CVD mortality rate was 13.8% and the percentage of disability-adjusted life years (DALYs) resulting from CVD was 6.3%. The prevalence of atrial fibrillation (AF) and atrial flutter was 0.1%, while that of rheumatic heart disease (RHD) was 1.2%. The total RHD mortality rate was 0.14% of all deaths (WHO, 2020).

The Ministry of Health has adopted the American Heart Association guidelines for managing patients with ACS (Ministry of Health, Kenya, 2018). The Kenya Ports Authority clinics have incorporated the use of AHA ACLS in the management of patients with ACS. All clinicians at KPA have successfully undergone ACLS training and recertification every 2 years. However, there are insufficient data on institutional factors influencing the adherence with the standard guidelines in managing ACS. A study at Kenyatta National Hospital found that the major barriers to ACS care at Kenyatta National Hospital include inadequate diagnostic and therapeutic capabilities, lack of hospital-wide ACS guidelines, undertraining of healthcare providers and delayed presentation of patients seeking care (Bahiru et al., 2018).

A further study found that during the acute management phase, dual antiplatelet use was 87%. The rates of beta-blocker use (72%) within the first 24 hours of admission and anticoagulant use (72%; 80% enoxaparin) during

hospitalization were also relatively high. A minority (33%) of patients with STEMI was eligible for reperfusion therapy but only 5% received reperfusion. The in-hospital mortality rate was 17%, and the highest among individuals presenting with STEMI (21%) (Bahiru et al., 2018). While there are well-developed guidelines for managing Acute Coronary Syndromes, empirical evidence has shown that not all people receive appropriate treatment due to either clinician-related or hospital-based factors. The study sought to assess the institutional related factors influencing adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

2. Literature Review

A. The AHA Guideline

As per the AHA guideline for patients presenting with chest pains, the first step is the initial evaluation, which involves taking the history of the patient, physical examination and diagnostic testing. The history includes characteristics and duration of symptoms relative to presentation as well as related features and cardiovascular risk assessment should be obtained (ACCF/AHA Task Force, 2021).

The initial physical examination should focus on evaluating acute coronary syndrome or other potentially life-threatening causes of chest pain including aortic dissection, pulmonary embolism, esophageal rupture and complications. The diagnostic testing goals in patients presenting to the ED or office with acute chest pain are: 1) identify life-threatening causes; 2) determine clinical stability; and 3) assess need for hospitalization versus safety of outpatient evaluation and management. These concerns entail consideration of the full extent of clinical data. The ACC/AHA STEMI and NSTEMI-ACS guidelines categorize chest pain causes into 4 types: STEMI, NSTEMI-ACS, stable angina, and non-cardiac. The 12-lead ECG, which should be acquired and interpreted within 10 minutes of arrival at a medical facility, is pivotal in the evaluation because of its capacity to identify and triage patients with STEMI to urgent coronary reperfusion. Other ST-T abnormalities consistent with possible ischemia also mandate prompt evaluation in a hospital setting. In both cases, transfer should be by EMS (ACCF/AHA Task Force, 2021).

Patients with chest pain and new ST-elevation, ST depression, or new left bundle branch block on ECG should be treated according to STEMI and NSTEMI-ACS guidelines. The AHA/ACC guidelines for NSTEMI-ACS and heart failure all recommend chest radiographs on presentation, although this should not delay urgent revascularization if it is indicated (ACCF/AHA Task Force, 2021).

Cardiovascular biomarkers can be useful for the diagnostic and prognostic assessment of patients with chest pain. Their most important application in clinical practice is for the rapid identification or exclusion of myocardial injury. Further Cardiac Testing includes Anatomic Testing and diagnostic testing. The anatomic testing involves Coronary Computed Tomography Angiography and Invasive Coronary

Angiography. Diagnostic Testing, which includes Exercise ECG, Echocardiography/Stress Echocardiography, Stress Nuclear (PET or SPECT) Myocardial Perfusion Imaging and Cardiovascular Magnetic Resonance Imaging (ACCF/AHA Task Force, 2021).

The guideline further requires for choosing the right pathway with Patient-Centric Algorithms for Acute Chest Pain. After initial evaluation, the next step is determining whether further diagnostic testing is needed to establish a diagnosis or formulate a disposition plan (ACCF/AHA Task Force, 2021).

Patients with acute chest pain and suspected ACS cover a spectrum of disease likelihood and stratification into low-versus intermediate or high-risk groups once STEMI has been excluded. This stratification is important to guide subsequent management. Although most high-risk patients identified by CDPs should undergo cardiac catheterization, these patients still require a clinical assessment to determine if invasive evaluation is appropriate (ACCF/AHA Task Force, 2021).

B. Level of Adherence to the American Heart Association Guidelines

A review of the past studies identified several studies on the level of adherence with the American Heart Association Guidelines. Rajesh (2019) did a retrospective study on the evaluation of adherence to the Standard Guidelines and found that the median adherence index (percentage of optimal adherence with guidelines) was 0.96. In addition, a clear relationship between the extent of guideline implementation, and 1-year mortality was shown and this relationship remained strong after stratification on the risk score at admission and the type of MI. In a systematic literature review study by Engel *et al.* (2017) adherence rates varied widely within and between 45 eligible studies, ranging from less than 5.0% to more than 95.0% for recommendations on acute and discharge pharmacological treatment, 34.3% - 93.0% for risk stratification, and 16.0% - 95.8% for performing coronary angiography. Seven studies indicated that higher adherence rates were associated with lower mortality.

Deedwania *et al.* (2017) studied adherence with guideline-directed therapy in diabetic patients admitted with acute coronary syndrome revealing that diabetic patients were less likely to get LDL checks (65% vs 70%) and less frequently prescribed statins (85% vs 89%), RAAS blockers for LV dysfunction (80% vs 84%) and dual-antiplatelet therapy (69% vs 74%). The results demonstrate gaps in adherence with guidelines-directed therapy in diabetic patients. Using a cross-sectional study, Hosseinzadeh-Shanjani *et al.* (2019) evaluated the adherence of cardiologist physicians to the AHA guideline in approach to risk factors of cardiovascular diseases and established a proportion of 59%, 15%, and 26% for high, moderate, and low adherence to AHA guidelines, respectively. Denlinger and Keeley (2018) found that 20% of NSTEMI patients did not receive American College of Cardiology/American Heart Association guideline-based medical therapy.

Farahzadi *et al.* (2015) assessed adherence to ACC/AHA Guidelines in Iran where initial management based on the

current guideline including administration of aspirin and clopidogrel was performed in 98.4% and 95.0%, respectively. Intravenous heparin was administered in 67.0% of the patients, whereas 30.8% of patients received enoxaparin. Following the initial management, coronary angiography was performed in 563 (82.3%) patients within 48 hours from admission. Adherence to ACC/AHA guidelines for the management of NSTEMI in patients who presented to a tertiary health-care center was to a high degree.

In South Africa, there was a low application of treatment guidelines which led to high readmission and mortality. This was evidenced by the serious under-use of beta-blockers, aldosterone antagonists and digoxin (Szymanski *et al.*, 2018). Wachira & Otieno (2014) in a study on acute management of ST-elevation myocardial infarction in a tertiary hospital in Kenya revealed that in Kenya, whereas the majority of STEMI patients are evaluated within 10 min of presentation, less than 50% receive reperfusion therapy within the recommended time frame.

C. Institutional Related Factors Influencing Adherence to the American Heart Association Guidelines

1) Workload

High workload makes the clinicians focus more in clearing the queue and end up not adhering to every detail of the standard guidelines as per the institution (Almazrou *et al.*, 2020; Jiang *et al.*, 2020). This mostly occurs in places with a constrained workforce. Lack of adherence to standard clinical guidelines and policies has been associated with the shortage of healthcare workers. This leaves the only available staff with a very high workload, and in the process, they come up with shortcuts so as to serve all the patients (Chelogoi *et al.*, 2019).

Good adherence to clinical guidelines has also been associated with support from peers or superiors in adhering to the standards, as well as enough staff and time. Kissi *et al.* (2020) found that greater physician autonomy and greater control over the pace and content of clinical work were both associated with better professional satisfaction that allowed them to focus more exclusively on clinical care. Baradaran-Seyed *et al.* (2013) assessed the barriers of clinical practice guidelines development and implementation in developing countries and established practice environment theme as the key barrier. Locally, in a cross-sectional study in Embu teaching and referral hospital comprehensive care clinic, Mugoh *et al.* (2016) found that waiting time at the facilities caused by the workload were reported as key factors influencing adherence.

2) Patient Care Resources

The lack of appropriate resources for patient care has been considered as another key barrier in the use of standard guidelines in caring for patients with acute coronary syndrome. Resources such as medications, equipment and other non-pharmaceutical supplies affect care delivery (Fischer *et al.*, 2016; Almazrou *et al.*, 2020). Studies suggest that the lack of resources, time constraints and a heavy workload, can only be addressed by allowing sufficient time to put the principles into practice, creating clear duties in terms of standing orders, and

giving financial incentives (Almazrou et al., 2020; Fischer et al., 2016; Jiang et al., 2020). Lack of the appropriate medications and equipment like ECG machines and invasive procedure equipment contributed to lack of adherence to the standard guidelines among ACS patients.

Leighton et al. (2013) found that the institution of an EOS significantly improved adherence with ACC/AHA guidelines for cardiac monitoring at the time of admission. However, adherence worsened after the initial 48 hours, which may have been due to the ease of online reordering with our EOS.

Sorato, (2021) established reasons for non-adherence as insufficient government commitment, and specific health behaviors related to laws. Luz et al. (2020) sought the factors affecting treatment adherence of patients in a cardiac care unit. Significant associations were found between the type of affiliation to the health system, and the total treatment adherence degree. A study by Ashraf et al. (2021) found that a transition of care pathway for post-MI patients using readily available resources was associated with increased DAPT adherence and decreased 30-day unplanned readmissions. A study in Tanzania on provider-perceived barriers to diagnosis and treatment of Acute Coronary Syndrome identified system-related barriers including lack of diagnostic equipment, unavailability of treatments and referral system (Hertz et al., 2020).

Varwani (2018) assessed the preparedness towards acute coronary care in Kenya: a survey of the county hospitals found that most facilities surveyed were insufficiently equipped for management of ACS. Gikunda et al. (2021), on the other hand found that the overall model of health system-related factors were found to be significant and this included; quality of health service, physician-patient relationship, stock out, health education, and availability of medicine.

3) *Availability of the Guidelines*

Guideline availability allows one to refer and remind themselves what is expected during various situations. Studies on other medical conditions have revealed that health facilities that do not have easily accessible guidelines and standard operating procedures for use by healthcare workers tend to have poor adherence of the same hence affecting the outcome of care (Mitheu et al., 2019; Olajide et al., 2020).

While assessing the challenges in the implementation of institutional protocols for patients with Acute Coronary Syndrome. Shah and Nathan (2018) found that poor adoption of institutional protocols reduced the quality of care and efficiency. In thematic analysis, a study in Tanzania on provider-perceived barriers to diagnosis and treatment of acute coronary syndrome identified system-related barriers including lack of data regarding disease burden, absence of locally relevant guidelines and cost of care (Hertz et al., 2020).

A Kenyan study on the influence of institutional factors on access to healthcare revealed that poor implementation of health policies/protocols and shortage of drugs and essential supplies in hospitals contributed to poor outcomes and increased mortality (Chelogoi et al., 2019). Asiki et al. (2018) assessed the policy environment for prevention, control and management of cardiovascular diseases in primary health care

in Kenya. From the documents reviewed, there was no standalone policy for CVD management and care at the PHC level, but some aspects of CVD policy were covered in general NCD policy documents. Bahiru et al. (2018) identified major barriers to ACS care at Kenyatta National Hospital, including inadequate diagnostic and therapeutic capabilities, lack of hospital-wide ACS guidelines, undertraining of healthcare providers, and delayed presentation of patients seeking care.

3. Methodology

A descriptive cross-sectional study design was used. The study was carried out at the Kenya Ports Authority (KPA) clinics, i.e., Bandari and Kipevu in Mombasa, Kenya. KPA clinics are located in Mombasa Island along Shimanzi Road off Moi Avenue at Mvita Constituency. The target population was all 106 clinicians attending to patients who present with Acute Coronary Syndrome at the KPA clinics in Mombasa. These clinicians comprise 5 medical doctors, 80 nurses and 21 clinical officers who attend to these patients at the clinics as a team. All clinicians had undergone Advanced Cardiovascular Life Support training with recertification every 2 years.

The Census method was used. This provided for involvement of all the 106 clinicians. Quantitative data was collected using a self-administered, structured questionnaire.

Data from the self-administered questionnaire were computed, coded and analyzed using the Statistical Package for Social Sciences (SPSS) computer package version 25. Descriptive statistics derived from SPSS, e.g., mean, frequencies and percentages were used in the data analysis. Inferential statistics, including chi-square, were used to assess the relationship between institutional-related factors on adherence with the American Heart Association guidelines for Acute Coronary Syndrome and testing of the hypothesis. The presentation of the analyzed data was done in tables.

Ethical approval was sought from Mount Kenya University through the Ethics and Research Committee (MKU-ERC). Permission to conduct the study was also sought from the National Commission for Science, Technology, and Innovation (NACOSTI). Following clearance, the researcher sought authorization to conduct the study from the Kenya Port Authority's Head of Medical Services. In addition to getting informed consent from the study subjects, they were informed about the aim and advantages of the study, the confidentiality of their information, and volunteers.

4. Findings and Discussions

A. *Response Rate*

This study sought data from 106 respondents using a questionnaire. The researcher obtained 96 complete questionnaires making a response rate of 90.6%. The study did not obtain a 100% response rate because of the inconsistencies in some responses; some questionnaires were incomplete and others were not filled out at all.

B. Level of Adherence with the American Heart Association Guidelines for ACS

Table 1
Response on reference to the AHA guidelines when managing ACS patients

	Frequency	Percent
Yes	64	66.7
No	32	33.3
Total	96	100.0

Source: Field Data (2023)

The findings revealed that 66.7% of the respondents usually refer to the AHA guidelines when managing ACS patients while 33.3% indicated not to refer to the AHA guidelines when managing ACS patients. The findings imply that the majority of the clinical personnel usually refer to the AHA guidelines when managing ACS patients.

Table 2
Response on adherence to the AHA Acute coronary syndrome guideline

	Frequency	Percent
Yes	68	70.8
No	28	29.2
Total	96	100.0

Source: Field Data (2023)

The findings revealed that 70.8% of the respondents indicated that they adhere to the AHA guidelines when managing ACS patients, while 29.2% indicated not adhere to the AHA guidelines when managing ACS patients. The findings imply that the majority of the clinical personnel adhere to the AHA guidelines when managing ACS patients.

Table 3
Extent of adherence to the AHA Acute coronary syndrome guideline

	Frequency	Percent
Low	42	43.8
Moderate	48	50.0
High	6	6.3
Total	96	100.0

Source: Field Data (2023)

From the study findings, half of the respondents indicated moderate adherence to the AHA Acute Coronary Syndrome Guideline, 43.8% indicated low adherence, while 6.3% indicated high adherence to the AHA Acute Coronary Syndrome Guidelines. The findings imply that there is moderate adherence to the AHA Acute Coronary Syndrome Guideline among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

The respondents were further requested to identify some of the activities they conduct during the AHA Acute Coronary Syndrome Guideline process.

Table 4
Responses on activities conducted during the AHA ACS treatment

Activities	Yes		No	
	N	%	N	%
I give Aspirin to patients arriving with chest pain	30	31.3	66	68.8
I advise Aspirin at discharge to patients diagnosed with ACS	78	81.3	18	18.8
I record patient's history	96	100	0	0
I do a physical examination of patients arriving with chest pains	96	100	0	0
I obtain a 12-Lead electrocardiograph (ECG) on all patients with chest pains	90	93.8	6	6.3
I use MONA (morphine, oxygen, nitroglycerin, aspirin) in the management of ACS	30	31.3	66	68.8

Source: Field Data (2023)

From the findings, all the respondents (100%) record the patient's history and do a physical examination of patients arriving with chest pains, 93.3% obtain a 12-Lead electrocardiograph (ECG) on all patients with chest pains and 81.3% advise Aspirin at discharge to patients diagnosed with ACS. However, only 31.3% give Aspirin to patients arriving with chest pain and use MONA (morphine, oxygen, nitroglycerin, aspirin) in the management of ACS. The findings imply that the AHA Acute Coronary Syndrome Guideline is not fully adhered to among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. This has been illustrated by the fact that most of the respondents do not use MONA in the management of ACS.

C. Influence of Institutional-Related Factors on Adherence with the AHA Guidelines for ACS

Table 5
Availability of the American heart association guideline in the hospital

	Frequency	Percent
Yes	60	62.5
No	36	37.5
Total	96	100.0

Source: Field Data (2023)

The findings show that the majority of the respondents (62.5%) indicated that the hospital had the AHA guideline for Acute Coronary Syndrome management, while 37.5% indicated a lack of the guideline in the hospital. This implies that the hospital had the AHA guideline for Acute Coronary Syndrome management, but some of the medical personnel were not aware of its availability.

Table 6
Availability of the AHA guideline for the management of ACS* adherence

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	33.629 ^a	1	.000
Likelihood Ratio	34.410	1	.000
Linear-by-Linear Association	33.279	1	.000
N of Valid Cases	96		

Source: Field Data (2023)

The results in Table 6 indicate that $\alpha < p$ -value at 95% level of confidence ($\alpha=0.000$, p -value = 0.05%, chi-square value = 33.629). Therefore, the study rejected the null hypothesis (H_0) and concluded that there is a significant association between the availability of the AHA guideline in the hospital and the adherence to the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Thus, there is a significant association between the availability of the AHA guideline and adherence to the American Heart Association

guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

Table 7
AHA guideline accessibility

	Frequency	Percent
Yes	18	18.8
No	78	81.3
Total	96	100.0

Source: Field Data (2023)

The results show that 81.3% of the respondents indicated that the guideline is not readily accessible to healthcare workers. The findings demonstrate that the AHA guideline for the management of ACS is not readily accessible to healthcare workers.

Table 8
AHA guideline accessibility* adherence

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10.070 ^a	1	.002
Likelihood Ratio	15.309	1	.000
Linear-by-Linear Association	9.965	1	.002
N of Valid Cases	96		

Source: Field Data (2023)

The results in Table 8 indicate that $\alpha < p$ -value at 95% level of confidence ($\alpha=0.002$, p -value = 0.05%, chi-square value = 10.070). Therefore, the study rejected the null hypothesis (H_0) and concluded that there is a significant association between the accessibility of the AHA guideline in the hospital and the adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Thus, there is a significant association between accessibility of the AHA guideline and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

The study assessed whether the hospital offers training on the management of ACS.

Table 9
Hospital training on the management of ACS

	Frequency	Percent
Yes	86	89.6
No	10	10.4
Total	96	100.0

Source: Field Data (2023)

The majority of the respondents (89.6%) indicated that the hospital offers training on the management of ACS. This implies that the hospital offers training on the management of ACS. The study further assessed the type of training provided by the hospital.

Table 10
Type of training provided by the hospital

	Frequency	Percent
CMEs	18	18.8
ACLS	65	67.7
Others	3	3.1
System	10	10.4
Total	96	100.0

Source: Field Data (2023)

The findings showed that 67.7% of the respondents indicated ACLs training, 18.8% indicated CMEs and 3.1% indicated other types of training. The other types of training as indicated by the respondents, include Basic Life Support (BLS) training.

Table 11
Training provision on the management of ACS by the hospital* adherence

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	8.634a	1	.022
Likelihood Ratio	8.602	1	.018
Linear-by-Linear Association	8.628	1	.018
N of Valid Cases	96		

Source: Field Data (2023)

The results in Table 11 indicate that $\alpha > p$ -value at 95% level of confidence ($\alpha=0.022$, p -value = 0.05%, chi-square value = 8.634). Therefore, the study rejected the null hypothesis (H_0) and concluded that there is a significant association between training on the management of ACS by the hospital and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Thus, there is a significant association between training on the management of ACS by the hospital and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

The study sought to establish the challenges encountered in implementing the AHA Guidelines. The indicated the following challenges; lack of funds, inadequate equipment/setup and tools like an automated external defibrillator, interpretation of electrocardiograms (ECGs), lack of personnel, lack of medicines-like aspirin and Nitroglycerin, no guideline available, lost time during reference to the guideline, lack of designated team thus everyone manages differently, lack of easy charts to refer to when in need and lack of a catheterization laboratory in the facility.

The respondents were requested to indicate whether they are usually provided with all the resources for the management of the patients.

Table 12
Resources provision

	Frequency	Percent
Yes	6	6.3
No	90	93.8
Total	96	100.0

Source: Field Data (2023)

A greater majority of the respondents (93.8%) indicated that they are usually not provided with all the resources for the management of the patients. The findings imply that the respondents are usually not provided with all the resources for the management of the patients. The respondents indicated that the resources that are lacking most of the time are medications, equipment and non-pharmaceuticals.

Table 13

Resources provision* adherence with AHA guidelines for ACS management			
	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.909 ^a	1	.004
Likelihood Ratio	14.676	1	.031
Linear-by-Linear Association	12.879	1	.003
N of Valid Cases	96		

Source: Field Data (2023)

The results in Table 13 indicate that $\alpha > p$ -value at 95% level of confidence ($\alpha=0.004$, p -value = 0.05%, chi-square value =12.909). Therefore, the study failed to reject the null hypothesis (H_0) and concluded that there is a significant association between the provision of all the resources for the management of the patients and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Thus, there is a significant association between the provision of all the resources for the management of the patients and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

The study sought to assess whether the hospital was well-staffed to handle all the cases of ACS following guidelines.

Table 14
Adequacy of staffing

	Frequency	Percent
Yes	21	21.9
No	75	78.1
Total	96	100.0

Source: Field Data (2023)

The findings showed that over three-quarters of the respondents (78.1%) noted that the hospital was not well-staffed to handle all the cases of ACS following guidelines. The findings imply that the hospital was not well staffed to handle all the cases of ACS following guidelines.

Table 15
Adequacy of staffing* adherence

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	12.218 ^a	1	.000
Likelihood Ratio	18.297	1	.000
Linear-by-Linear Association	12.091	1	.001
N of Valid Cases	96		

Source: Field Data (2024)

The results in Table 15 indicate that $\alpha < p$ -value at 95% level of confidence ($\alpha=0.000$, p -value = 0.05%, chi-square value = 12.218). Therefore, the study rejected the null hypothesis (H_0) and concluded that there is a significant association between hospital staffing to handle all the cases of ACS following guidelines and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Thus, there is a significant association between hospital staffing and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya.

D. Discussion of Findings

The hospital had the AHA guideline for Acute Coronary Syndrome management, but some of the medical personnel were not aware of its availability. There was a significant association between the availability of the AHA guideline and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. The findings demonstrate that the AHA guideline for the management of ACS is not readily accessible to healthcare workers. There was a significant association between the accessibility of the AHA guideline and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. The findings agree with Mitheu et al. (2019) and Olajide et al. (2020) found that health facilities that do not have easily accessible guidelines and standard operating procedures for use by healthcare workers tend to have poor adherence.

The hospital offers training on the management of ACS. The study further found that there was a significant association between training on the management of ACS by the hospital and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Consistent with findings, other scholars such as Fischer et al. (2016) and Jiang et al. (2020) revealed that clinicians who had been trained on the guidelines are likely to adhere to them in clinical practice compared to their counterparts who encountered them in clinical practice without any form of training.

The challenges encountered in implementing the AHA Guidelines were: lack of funds, inadequate equipment/setup and tools like automated external defibrillators, interpretation of electrocardiograms (ECGs), lack of personnel and lack of medicines like aspirin and Nitroglycerin. Similarly, Jiang et al., (2020) found that a lack of the appropriate medications and equipment like ECG machines and invasive procedure equipment contributed to a lack of adherence. In addition, other challenges included the lack of a designated team thus everyone manages differently, the lack of easy charts to refer to when in need and the lack of a catheterization laboratory in the facility. Consistent with the findings, Baradaran-Seyed et al. (2013) on the barriers of clinical practice guidelines development and implementation in developing countries revealed that practice environment theme, resources and equipment were the key barriers.

There was a significant association between the provision of resources for the management of the patients and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. Similarly, Ashraf et al. (2021) found an association between readily available resources and increased DAPT adherence.

The findings showed that the hospital was not well staffed to handle all the cases of ACS following guidelines. In addition, there is a significant association between hospital staffing and adherence with the American Heart Association guidelines for Acute Coronary Syndrome among clinicians at Kenya Ports

Authority clinics in Mombasa, Kenya. The findings corroborate Almazrou *et al.* (2020) and Jiang *et al.* (2020), who found that a high workload makes clinicians focus more on clearing the queue and end up not adhering to every detail of the standard guidelines.

5. Conclusions and Recommendations

A. Conclusions

The study concludes that the associations between the availability and accessibility of the AHA guideline and adherence among clinicians at KPA clinics in Mombasa, Kenya, were significant. There was a significant association between training on the management of ACS by the hospital and adherence with the AHA guidelines for ACS among clinicians at Kenya Ports Authority clinics in Mombasa, Kenya. The hospital was not well staffed to handle all the cases of ACS following guidelines and the association between staffing of the hospital and adherence with the AHA guidelines for ACS was significant. There was a significant association between the provision of resources for management of the patients and adherence with the American Heart Association guidelines for ACS among the clinicians. The hospital encountered some challenges in implementing the AHA Guidelines, including lack of supplies, inadequate equipment/setup and tools like an automated external defibrillator, interpretation of electrocardiograms (ECGs), a lack of personnel, lack of medicines like aspirin and Nitroglycerin.

B. Recommendations

The KPA should increase the budget for the medical facilities to ensure adequate resources for ACS management like medications, equipment like defibrillators and AEDs as well as adequate staffing.

Medical Division management should ensure that medications such as aspirin, morphine, nitroglycerine and other resources are readily available at the point of use or care points in the clinics.

The KPA Clinics should formulate a simple algorithm that outlines the steps to be taken when managing ACS patients for ease of reference.

The KPA Clinics should ensure that their equipment is well-maintained for optimum functionality and effective management of ACS patients. This includes developing standard operating procedures (SOPs) on the use of equipment such as ECGs, defibrillators and AEDs as well as instructions on maintenance and cleaning.

KPA should continue offering training on the latest AHA guidelines for ACS to ensure that they are abreast with updated guidelines. The study further recommends random audits as well as post care audits to assess adherence to ACS guidelines.

Further studies should assess the determinants of adherence to the AHA guidelines for ACS among clinicians in other hospitals in Kenya.

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