

Nurses' Assessment practices and Immediate Interventions for Cardiac related

Chest Pain

In Adult Patients Presenting at the Emergency Department

Of at Kenyatta National Hospital, Kenya

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ABSTRACT

Coronary artery disease (CAD) is the leading cause of global mortality accounting for 15.9% of all deaths worldwide. Acute chest pain is the most common and leading complaint in patients with CAD. Therefore, prompt identification and treatment of a CAD related chest pain is critical to the treatment outcomes. Failure to recognize and treat cardiac related chest pain is associated with fatal outcomes. The aim of this study was to assess the chest pain evaluation practices of nurses and their initial interventions at the accident and emergency department of a Kenyatta National Hospital (KNH) in Kenya. This was a descriptive cross sectional study using a quantitative approach of data collection. A sample size of 62 emergency department nurses was selected using simple random sampling. Study approval was obtained from KNH-UoN Research Ethics Committee and KNH Research and Programme. Quantitative data was collected using self-administered questionnaires and analyzed using SPSS version 21. Of the 58 respondents, majority were female (69% n=40), within the age 41-50 years with KRCHNs (78% n=45) qualification and a nursing experience (33 % n=19) of over 20 years. Finding revealed variation in performance of the chest pain assessment practices and immediate interventions for patients identified to have cardiac chest pain. There is need for an evidence based sensitization training on acute chest pain assessment in order to optimise care and improve clinical outcome of patients with acute chest pain.

KEY WORDS

Acute chest pain, Cardiac chest pain, Chest pain Assessment, acute coronary syndrome, coronary artery disease.

1. BACKGROUND

Coronary artery disease (CAD) is a group of heart disease that usually involves the partial narrowing or total blockage of the coronary arteries (Al-Khatib *et al.*, 2017a). Globally CAD morbidity and mortality rates are alarming. CAD is the leading cause of global morbidity and mortality (Vedanthan *et al.*, 2014), accounting for 15.9% of all death worldwide (Robson *et al.*, 2015). The incidences of coronary artery disease are increasing in sub-Saharan Africa where their management remains a challenge (Kakou-Guikahue *et al.* 2016).

Chest pain is a common symptom in patients with CAD. Moreover, CAD related chest pain is associated with fatal outcomes and therefore require urgent attention. Patients presenting with chest pain should be rapidly evaluated to determine if the symptoms are suggestive of acute ischemia (Dezman, Mattu and Body, 2017).

Immediate Nursing assessment of patients experiencing chest pain is focused on ruling out cardiac related chest pain (Wireklint Sundström *et al.*, 2016). However, research continue to suggest that nurses lack competence in assessing cardiac related chest pain (Hernández-Padilla *et al.*, 2017) and are often observed straggling with the emergency care of patient with cardiac related chest pain in the emergency department (Rolskov Bojsen *et al.*, 2015).

Nurses are often the first clinicians attend to presenting with chest pain. Therefore, their initial care may be an important modifiable factor influencing care outcomes for patients presenting with chest pain in the emergency department (Munroe *et al.*, 2015). Thus there is need to determine nursing capacity and practices in assessment and management of patients with CAD at the Emergency Department of tertially hospital in Kenya.

2. LITERATURE REVIEW

Chest pain is a common symptom. It is estimated that up to 40% of general population experience chest pain at some points in their lives (Thampy, 2013). Chest pain is also the commonest symptoms that patients present with in the emergency department, accounting for approximately up to 10% of all medical emergency room admissions (Wireklint Sundström *et al.*, 2016).

It is estimated that In Europe, up to 38% of men aged 40-49 attending general practice clinics report a history of chest pain (Tavella, 2011) while in the united states, about six million people are admitted in the emergency department admissions per year for chest pain at a cost of approximately US dollar 8 billion (Tavella, 2011).

Chest pain caused by coronary ischemia can be classified into two: typical and atypical chest pain. The typical chest pain of ischemia is characterized by a retrosternal sensation of pressure or heaviness, radiating to the left arm, neck or jaw. This pain may be intermittent or persistent. The typical chest pain may have associated symptoms such as epigastric pain, indigestion-like symptoms and isolated dyspnea (Sanchis-Gomar *et al.*, 2016).

In making a diagnosis of coronary ischemic chest pain, history and physical examination are never sufficient to distinguish between the many conditions that can cause acute chest pain syndrome. However high risk features of chest pain such as radiation to the left arm, substernal location and history of acute myocardial infarction are reliable in predicting acute coronary syndrome (Hollander *et al.*, 2016).

Nursing assessment may be an important modifiable factor influencing time to treatment for patients presenting with chest pain in the emergency department. Emergency nurses are required to be highly skilled at performing accurate and timely patient assessment. When patients present to the accident and emergency department, the emergency nurses performs a brief assessment and allocates a triage category indicating the level of urgency (how long the patient can wait to be seen by a medical officer) of the presenting problem after which the patients are located to a treatment area (Munroe *et al.*, 2015).

Emergency nurses ability to perform an accurate initial assessment is imperative to recognize the urgency and treatment needs of patients and to develop baseline data from which any changes in in the condition of patient may be measured against. Failure to perform timely accurate assessment has been reported to result in adverse patients' outcome such as death (Basu and Sharma, 2016)

Determining the cause of chest pain depends on the patient's history and objective data from the physical exam and to a greater extend diagnostic tests. The nurse uses his/ her assessment skills to obtain pertinent history and perform quick but thorough physical assessment. However, research has also established that physical examination seldom is useful for distinguishing patients with ACS from those with non-cardiac chest pain (Maglanque, 2017).

Although some physical findings are common for the various causes of the chest pain, a patient with chest pain may not have all of these signs, and some patients may not have any signs at all. Some of the findings include hypotension, bradycardia or tachycardia jugular venous distension diaphoresis, and anxious appearance, and low grade fever. (Parsonage, Cullen and Younger, 2013)

3. MATERIAL AND METHODS:

This study adopted a descriptive cross sectional study designs. A quantitative approach was employed in data collection, analyses and interpretation of the results. Target population consisted of nurses working in the emergency department of a National Hospital in Kenya, one of the largest hospitals in east and central Africa. Using simple random sample size of 62 nurses was determined and selected for quantitative study using Fisher *et al.* (2003) formulae. Approval for carrying out the study was obtained from KNH-UoN Research Ethics Committee and KNH research and programmes department

Pretesting of the data collection tools was carried out in another emergency department with similar characteristic the cardiology department in order to identify inconsistencies and lack of clarity in the questions. The tools were then revised and improved on the bases of the pretest results.

Quantitative data was collected using self-administered questionnaires containing closed ended questions. Collected data was verified them for accuracy and completeness. Data cleaning was validated periodically and then all the data was merged to one complete database. Information captured in the questionnaires was entered into the Microsoft excel program. Quantitive data was analyzed using SPSS version 21. Descriptive statistics was analyzed using frequency distribution, means, percentages and chi squire. Measurement of association was measures using logistical regression modeling and correlation.

4. RESULTS

4.1 Demographical Data

From 62-targeted nurses, feedback was received from fifty eight (58), resulting in a response rate of 94%. Table 1 shows that majority of the respondents were female (69% n=40), and 41% n=24 within the age 41-50 years. The majority (78% n=45) were KRCHNs, 33 %(n=19) had over 20 years of experience. Of the 36 respondent with specialisation 62% (n=30) had expecialised in A&E nursing. Majority had training in BLS (91% n=53) and ACLS 69% n=40)

TABLE 1 Demographic Characteristics of the Respondents

DEMOGRAPHIC VARIABLES	FREQ.	PERCENTAGE
Age (in years)		
20-30	5	9%
31-40	18	31%
41-50	24	41%
Above 50	11	19%
Total	58	100
Gender		
Male	18	31%
Female	40	69%
Total	58	100
Professional qualification		
Enrolled Nurse	2	3%
Kenya Registered Community Health Nurse(KRCHN)	45	78%
Bachelor Of Science In Nursing (BSCN)	11	19%
Masters In Nursing(MScN)	0	0%
Doctor Of Philosophy(PHD)	0	0%
Total	58	100
Years of practice as a nurse		
1-5 years	5	9%
6-10 years	7	12%
11-15 years	12	21%
16-20 years	15	26%
Above 20 years	19	33%
Years of worked in the A& E department		
1-5 yrs.	26	45%
6-10 yrs.	20	34%
11-15 yrs.	5	9%
16-20 yrs.	4	7%
Above 20 yrs.	3	5%
Specialized qualification		
Yes	36	62%
No	22	38%
Type of Specialized Qualifications		
A & E Nursing	30	52%
Critical Care Nursing	5	9%
Response on Life Support Course undertaken		
Basic Life Support	53	91%
Advanced Cardiac Life Support (ACLS)	40	69%
Advanced Trauma Life Support (ATLS)	25	43%
Pediatric Advanced Life Support (PALS)	16	28%

4.2 Evaluating Patient for Cardiac Related Chest Pain

Table 2 shows that majority of respondents relied on the patient' information on location of chest pain (64%,n=37), onset of chest pain (62% , n=62), treatment given (2%, n=30), severity of chest pain(55%, n=32), duration of chest pain (59%, n=34), and characteristics of chest pain (53%, n=31) when making decision of a cardiac chest pain.

Table 2: Frequency of obtaining relevant information associated with cardiac chest pain

Information on chest pain	Frequency				
	Always	Very often	sometimes	Rarely	Never
Location of chest pain	64% (n=37)	28(n=16)	7%(n=4)	2%(n=1)	-
Onset of chest pain	62% (n=62)	26% (n=15)	12% (n=7)	-	-
Any treatment given	52%(n=30)	31%(n=18)	10%(n=6)	3%(n=2)	3%(n=2)
Severity of chest pain	55%(n=32)	21%(n=16)	10%(n=6)	5%(n=3)	-
Duration of chest pain	59%(n=34)	21%(n=12)	19%(n=11)	2%(n=1)	-
Characteristics of chest pain	53%(n=31)	24%(n=14)	16%(n=9)	7%(n=4)	-
Associated symptoms	34%(n=20)	34%(n=20)	26%(n=15)	5%(n=3)	-
Relieving factors	34%(n=20)	28%(n=16)	24%(n=14)	14%(n=8)	-
Aggravating factors	38%(n=22)	19%(n=11)	34%(n=20)	9%(n=5)	-
Risk factors	21%(n=12)	33%(n=19)	24%(n=14)	21%(n=12)	2%(n=1)
Average	47%	27%	18%	7%	1%

4.3 Initial interventions performed by nurses on patients after suspecting he/she had cardiac related chest pain

Table 3 shows that upon suspicion of patients was experiencing cardiac related chest pain all respondents (100%,n=58) immediately attached patients on cardiac monitor and obtained vital signs and also reassure the patients and inform them of the care to expect. Of the respondents, 84% (n=49) administered aspirin, nitroglycerin or morphine only after patient has been seen by the doctor and 79% (n 46) fast tracked the patients to consult the doctor before doing the 12 lead ECG. Majority (74%, n=44) of the respondent reported that they performed ECG only after the doctor sees the patient and ECG ordered while 72% (n=42) of the respondents connected the patients on oxygen when saturation levels fell below 93 %, and 64% (n=37) continued with monitoring of vital signs and obtaining ECG trace.

Majority (57, n=33) of the respondents do not perform electrocardiography procedure. Majority (55% n=32) prefer to fast track the patients for review before the 12 lead ECG is performed. Majority (64%, n=37) of the respondents did not interpret the ECG and 72 % (n=42) of the respondents did not perform intravenous line cannulation and obtain blood samples for troponins.

Table 3: Intervention for patients with suspected cardiac related chest pain

Intervention for patients with suspected cardiac related chest pain	Performed		Not performed	
	Frequency	%	Frequency	%
I immediately attach patient on a cardiac monitor and obtain vital signs	58	100	-	-
I reassure the patient and inform her/him of the care to expect	58	100	-	-
I give aspirin, nitroglycerin or morphine only after patient is seen by the doctor	49	84	9	16
Fast track the patient to consult the doctor before doing 12 lead ECG	46	79	13	11
I perform 12 lead ECG only after the doctor writes an order sheet	43	74	15	26
Administer supplemental oxygen when level is less than 93%	42	72	16	28
I continue with monitoring of vital sign and obtain ECG trace	37	64	21	36
I ensure blood samples taken to the laboratory after doctors review	33	57	25	43
I perform initial 12 lead ECG and analyse it before patient initially consults the doctor	26	45	32	55
I fast track the patient back for review	25	43	33	57
I interpret ECG changes	21	36	37	64
I perform intravenous line cannulation and obtain blood samples for troponins	16	28	42	72

4.4 Relationships between Demographic Variables, and Obtaining Relevant Information associated with cardiac related chest pain

Table 4 shows that there was positive relationship between obtaining information and year of experience as a nurse (p-0.005), having BScN qualification (p-0.000, specialising in A&E (P-0.001), CCN (P-0.048) and PALS (P-0.000) and obtaining information at confidence interval of 95%

Table 4. Regression output table on relationship between demographic variables and obtaining information

Variable	Obtaining information	
	tStat	p-value
Age	-0046	0963
Gender	-2.023	0049
Year of practice as a nurse	2.990	0.005
Experience in A&E	-2435	0.019
KRCHN	0.092	0.927
BScN	3.890	0.000
A& E NURSE	3.732	0.001
CCN	2.033	0.048
ACLS	0.674	0.504
ATLS	-2.376	0.022
PALS	4.028	0.000

DISCUSSION

This study found that majority of the respondents were female and about half were male. This is in line with the findings of a study on Kenya nursing workforce which showed that majority of Kenya nursing workforce is comprised of female (Martha Rogers, 2012). This imply that the views expressed in this findings are gender sensitive and can be taken as representative of both genders. This study also established that among the registered nurses a significant number of nurses lacked specialisation in emergency nursing. This is congruent with study done in Kenya which showed that Kenya registered community health nurses comprise 57.8% of the Kenya nursing workforce (Martha Rogers, 2012)

Regression findings in this study revealed that nurses with more years of experience were more likely to perform better in obtaining relevant information and performing nursing roles. However, nurses who had worked more years in the accident and emergency department tended to perform poorly in obtaining relevant information and performing nursing roles

This study revealed that nurses with degree in nursing, higher diploma in A&E nursing, higher diploma in critical care nursing, Paediatric Advanced Life Support, were likely to perform better in the practice of obtaining relevant information and performing nursing roles. This is comparable to a study carried out in Britain and established that nurses with higher professional qualification and those who and greater number of hours of practicing risk stratification gave better results in assessment and management of patients with cardiac chest pains (Rathod, Ward and Farooqi, 2014). Therefore, there is need to encourage the KRCHN, to pursue BScN, accident and emergency or critical care nursing.

This study established that chest pain was often a common cause of patients visit in the accident and emergency department of Kenyatta national hospital. This finding agrees with Wireklint Sundström et al., (2016) study, which found out that chest pain accounted for up to 10% of all medical emergency room admissions.

In the evaluation of chest pain, this study found out that there was variation in practice on chest pain assessment. Most of nurses did not obtain information about associated symptoms relieving factors, aggravating factors, risk factors. It also emerge that most of the nurses tend to rely on information on location of chest pain, onset of chest pain, treatment administered, severity of chest pain, and duration of chest pain to decide whether chest pain patients have cardiac or non-cardiac chest pain. Numerous studies have demonstrated variation in assessment practices and identified nurses to have difficult assessing chest pain leading to poor outcomes such as delay in initiating treatment of patients (Ayerbe et al., 2016).

This research also established that other than two role, which include obtaining vital signs and fast tracking patients, nurses, had varied role performance in the initial interventions for patients suspected to have cardiac related chest pain. Majority preferred fact tracking the patient to be reviewed by the doctor before performing other roles. This variation in interventional approaches to cardiac chest can be attributed to poor or lack of utilization of chest pain protocol. This findings are consistent with a study done in South Africa which revealed that nurses who did not use chest pain protocol had varied treatment approaches to patients with cardiac related chest pain (Pelter *et al.*, 2016). This shows that need to there is need for sensitization training on chest pain assessment and use of protocols in order to address the practice variation.

CONCLUSION

Nursing assessment of acute chest pain is critical to optimising care of patients identified to have cardiac related chest in the accident and emergency department. However, nurses working in the accident and emergency department at Kenyatta national hospital showed variation in assessment practices and in the role performance in the care of patients identified to have cardiac related chest pain. This variation in practice need to be addressed to improve care and clinical outcomes of patients with acute chest pain in the emergency department at Kenyatta National Hospital

RECOMMENDATION

Nurses should be sensitize and trained nurses on chest pain assessment and immediate care of patients with cardiac related chest pain

KRCHN working in the accident and emergency department should be encouraged to pursue BScN, and train in life support courses (BLS, ACLS,) that were found to improve performance in assessment and initial intervention of patients with acute chest pain

COMPETING INTEREST

The authors declare that they have no competing interest regarding publication of this paper

FUNDING

This study was partially funded by Kenyatta National Hospital, Kenya

ACKNOWLEDGEMENT

The authors wish to specially thank the Kenyatta National Hospital (KNH)-University Of Nairobi (UON) ethic and research committee and KNH accident and emergency department for granting approval to conduct this study

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