

# Nurses' Perception of the Quality of Patient Care in Selected County Hospital Critical Care Units in Kenya

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**Abstract:** The global Intensive Care Units perception of quality of patient care remains below average with poor indicators such as high mortality and high infection rates been reported despite the technological advancements. Studies have reported characteristics among the nurses and the institution to have a profound impact on the perception of the quality of care the patient receives. This study assessed the perception of quality patient care, the association between nurses' characteristics and the perception of patient care, the association between institutional characteristics and perception of patient care and the predictors of the perception of care in selected hospitals critical care units in Kenya. The study was a correlational study that's used stratified sampling and census sampling to collect data in selected counties critical care units in Kenya. The study findings revealed that one third (33%) of the nurses rated the quality of care as good while the rest two thirds (67%) rated the quality of care in their unit as fair or poor. Test for association (Chi-square) was conducted to investigate demographic characteristics and nurses' perception of quality of patient care and revealed that years worked in ICU ( $p < 0.001$ ), specialization in CCU ( $p = 0.023$ ) and nursing cadre ( $p < 0.001$ ) were significantly associated with the nurses' perception of quality patient care. The findings also revealed that all institutional factors assessed were significantly associated with the nurses' perception of quality patient care ( $p < 0.001$ ) apart from multidisciplinary teamwork in the unit where there was no association found ( $p = 0.253$ ). Regression analysis revealed that determinants like: years of experience in CCU, specialized in CCU, adherence to aseptic procedure, moisture and incontinence checks and availability of VAP management resources were independently associated with the nurses' perception of quality patient care. This study concluded that nurses' perceptions of quality of patient care in selected critical care units was below average and was greatly influenced by nurses' experience, specialization, nursing cadre and institutional characteristics.

**Keywords:** Association, Kenya, Nurse, Perception, Quality.

## 1. Introduction

Quality care is a phenomenon that is reflected by perceptions of quality and quality indicators indicating the extent to which health-care services provided to patient populations improve desired health outcomes. In order to achieve this, health care must be safe, effective, timely, efficient, equitable and people-

centered (Carla & Claudio, 2016; Valiani et al., 2017). Critical care nurses are among health care specialists who evaluate intensive care patients, recognize complications and administer care accordingly. Such roles make these nurses' perception of quality of patient care a major determinants of quality of care of the ICU patients (Andersson et al., 2019; Mona, 2018). A study by Nantsupawat et al., (2016) reported that 16% of the interviewed nurses on quality of care in their work units had the perception it was below par which impacted the overall outcome of the patient. In this study the nurse's characteristics contributed to below average perception of quality of nursing care as evidenced by patient falls, increased medication errors, and increased infections among the ICU patients (Nantsupawat et al., 2016).

Globally studies have reported below average quality of care in ICUs, in a study by Onal et al., (2018), septic shock was reported at 79% among ICU patients and was considered to greatly influence the perception of quality of care. Pressure ulcers, length of stay in the ICU, infections and quality of nursing care have also been reported to be significant towards impacting the patient outcome in critical care units (Apostolopoulou et al., 2014; Önal et al., 2018).

The bulk of African ICU admissions are from emergency settings and surgical referrals. Some of the reported factors that influence the quality of nursing care in studies are: few ICU beds, limited life-saving equipment, low consumable hospital supplies, shortage of intensivists, shortage of ICU-trained staff and practicing beyond the scope of practice. Quality indicators like crude ICU mortality rate have been reported at 34.6% following post-operative cases. The prognosis was reported to be impacted by poor pre-hospital trauma quality of care, inadequate health infrastructure and delays between illness and intervention (Malelelo-ndou et al., 2016; Onyekwulu & Anya, 2015; Wise et al., 2017).

A study by Nyikuri et al., (2020) outlined that to improve the quality of care in the Kenya health sector the perception and experience of the nurse needs to listen to and implemented to achieve better perception of health care. Nurses perception of quality patient care is paramount in the policies and statues of

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the health care sector if a good perception of care is to be realized (Nyikuri *et al.*, 2020). There is little data on the state of the nurses working in the new county CCUs in Kenya. The nurses' perception of care in these units is not well documented since the implementation of devolution. National statistics have reported poor patient outcome and high patient burden in the national referral system specifically high mortality and infection rates suggesting a problem in the utilization and functionality of the county CCUs in Kenya. Hence this study explored the perception of patient care and the characteristics within the nurses and the institution to try to fill the knowledge gap of the perception of the quality of care the county CCU system.

#### A. Broad objective

To evaluate nurses' perception of quality of patients care in selected county hospital critical care units in Kenya.

#### B. Specific objectives

1. To determine the nurses' perception of quality of patient care in selected county hospital CCUs in Kenya.
2. To determine the association between nurse characteristics and the nurses' perception of quality of patient care in selected county hospital CCUs in Kenya.
3. To determine the association between institutional characteristics and the nurses' perception of quality of patient care in selected county hospital CCUs in Kenya.
4. To determine the predictors of the nurses' perception of quality patient care in selected county hospital critical care units in Kenya.

## 2. Methodology

#### A. Design

The study utilized a descriptive correlational study design that aimed at studying the association between nurses' characteristics, institutional factors and the perception of quality of patients' care.

#### B. Study variables

The study had two independent variables. Nurse characteristics and institutional. Nurses' characteristics were nurses' age, nurses' gender, nurses' experience, nurses' education level, nurses' cadre, nurses' specialization, nurses' attitudes and nurses' religion. Institutional characteristics were resource satisfaction, CCU Policy and guidelines adherence satisfaction. The Dependent variable was nurses' perception of quality patient care in selected county CCUs in Kenya.

#### C. Study population and sample

The target population was the 129 nurses working at Machakos, Murang'a, Nyeri and Embu Level 5 referral hospital critical care units in the months of May to December 2021. The study used Taro Yamane sample size formula to get a sample size of 93 nurses.

#### D. Sampling technique

The researcher used both stratified sampling method and census sampling technique to collect data. Stratified sampling method was used to group all the county units into stratum and census-sampling method was used to collect data from all the available population.

#### E. Instruments

The study used a questionnaire administered to the nurses working in the selected county CCUs. The instrument was informed by a study on nurse perceived quality of care in ICUs and associations that determined them (Stalpers *et al.*, 2017). The individual Likert scales were tested for internal reliability using Cronbach alpha test. Pretesting of the tools was done at Makeni level 5 Hospital CCU. Reliability and validity were satisfied.

#### F. Collection of data

The researcher embarked at collecting data from the different hospitals on a weekly basis, where the researcher visited one center for a week and collected data exhaustively on that center before moving to the next. After the obtain consent from the nurses and reassuring them of anonymity and confidentiality the nurses filled the questionnaire and gave it back to the researcher. The researcher availed himself to explain queries from the data collection tool where need be.

#### G. Data Analysis

Data was pre-analyzed once the raw data was collected. The responses were assigned numerical values, tabulated and then categorized in terms of the variables. Statistical Package for the Social Sciences (SPSS) version 24 was used as the data analyses packages of choice. Descriptive statistics was summarized using Statistical Package for the Social Sciences (SPSS) version 24. Associations between the different variables were analyzed using Chi-Square test level of significance of p value 0.05 and binary logistic regression statistics done to determine the predictors of the perceptions of quality patient care using SPSS version 24.

#### H. Ethical considerations.

Authority to conduct the study was sought from the National Commission for Science, Technology and Innovation (NACOSTI). Administrative authorization to carry out the study was sought from the administration of the selected hospitals in Machakos, Embu, Kiambu, Nyeri Counties and Makeni County ethic review boards.

A written informed consent was be obtained from the healthcare providers prior to their participation in the study. Participation in the study was voluntary and participants had the right to opt out of the study at any stage with any future repercussions from any organization the researcher is involved with. The respondents were assured of privacy and confidentiality of the information they will gave and their names will not be shared with the administration or anywhere in the study. The answering of the questionnaire was encouraged to be on individual basis as opposed to focused groups to promote care and protection of the research

participants. The purpose of the study was disclosed on the consent. Data collected was handled carefully and not shared to unauthorized personnel. Participants were assured of good data management.

To promote community considerations, the results of the study will be shared back to the individual nursing community and the progress of the study in the process of policy making made available to the nursing community.

### 3. Results

#### A. Sociodemographic findings

Data was obtained on nurses' characteristics, institutional characteristics and the perception of quality patient care from nurses working in the selected county hospital CCUs in the months of May to December 2021. The selected county critical care units were: Machakos, Muranga, Nyeri and Embu. The response rate for the questionnaire was 100% and all the questionnaires were analyzed.

The findings on demographic characteristics revealed that majority, 48 (46.60%) of the nurses were aged between 31-40 years, were Christians 102 (99%) and majorly Female 79 (77%). Majority of the respondents 91 (88%) had less than 10 years' experience. Majority of the nurses were CCU trained 73 (71%). About 57 (55%) of the respondents had less than one-year post training experience. In terms of cadre majority of the nurses were Nursing officer 2 32 (31%).

#### B. Nurse level of satisfaction with resources in the selected county CCUs in Kenya

The nurses were asked to indicate their level of satisfaction to resources. From the findings, 69 (67%) were strongly dissatisfied with the nurse patient ratio, 48 (27%) of the were dissatisfied with the availability of consumables while 46 (45%) were satisfied with the equipment for cardiac management in the unit. About 61 (59%) of the respondents reported satisfaction with the multidisciplinary teamwork and only about 13 (13%) reported dissatisfaction. Majority of the respondents 55 (54%) were satisfied with consumables and resources for VAP management availability to support the policies. Of the nurses' 45 (44%) of the respondents were

satisfied with consumables/resources for CLABSI management are availability to support the guideline while on the contrary 28 (27%) were dissatisfied. Majority of the nurses' 91 (88%) were satisfied with availability of ripple mattresses to support the management guidelines and 73 (71%) were satisfied with the adequacy of PPEs for patient management while 15 (15%) were not.

Table 1  
Nurses' sociodemographic characteristics

Variable	Category	n (%)
AGE	21-30 years	19 (18%)
	31-40	48 (47%)
	41-50	28 (27%)
	51 years above	8 (8%)
GENDER	Male	24 (23%)
	Female	79 (77%)
YEARS WORKED IN ICU	less than 1 year	39 (38%)
	2-5 years	31 (30%)
	6-10 years	21 (20%)
	11-15 Years	10 (10%)
	16 years and above	2 (2%)
EDUCATION LEVEL	Higher diploma	65 (63%)
	Diploma	8 (8%)
	Degree	28 (27%)
	Masters	2 (2%)
SPECIALISED IN CRITICAL CARE	Yes	73 (71%)
	No	30 (29%)
YEARS POST SPECIALISATION	Less than 1 year	57 (55%)
	2-5 years	33 (32%)
	6-10 years	9 (9%)
	above 10years	4 (4%)
NURSING CADRE	ACN	9 (9%)
	SNO	11 (11%)
	NO1	25 (24%)
	NO2	32 (31%)
	NO3	18 (17%)
	ECNO	8 (8%)
RELIGION	Muslim	1 (1%)

#### C. Nurse level of agreement with policy and guideline in the selected county CCUs in Kenya

The nurses were asked to indicate their agreement to policies and guidelines in place in the CCUs. The respondents 64 (62%) agreed with the policies and guidelines put in place for VAP management while a small percentage 20 (20%) disagreed.

Table 2  
Nurses' level of satisfaction with resources in the selected county CCUs in Kenya

Resources satisfaction perception	Satisfied	Neutral	Dissatisfied
Nurse patient ratio in the unit	13(13%)	21 (20%)	69(67%)
Availability of consumables for provision of quality care	26(25%)	29 (28%)	48(47%)
The equipment for cardiopulmonary management in the unit	46(45%)	30 (29%)	27(26%)
Multidisciplinary teamwork in the unit	61(59%)	29 (28%)	13(13%)
All the consumables/resources for VAP management are readily available.	55(54%)	23 (22%)	25(24%)
All the consumables/resources for CLABSI management are available in time	45(44%)	30 (29%)	28(27%)
All the consumables/resources for urine catheter management are available in time.	54(52%)	26 (25%)	23(22%)
Ripple mattress for pressure ulcer management are available	91(88%)	6 (6%)	5(5%)
There is adequate PPEs for patient management	73(71%)	15 (15%)	15(15%)

Table 3  
Nurses level of agreement with policy and guidelines in the selected county CCUs in Kenya

Perceptions to policy and guidelines agreement	Agreed	Neutral	Disagreed
Policies and guidelines are in place for VAP management	44(42%)	19 (18%)	20(20%)
I am satisfied with the policies and guidelines in place for CLABSI management	60(58%)	20 (19%)	23(23%)
Policies and guidelines are in place for urine catheter management	60(58%)	22 (21%)	21(20%)
Policies and guidelines are in place for pressure ulcer management	72(70%)	18 (17%)	13(13%)
Equipment are repaired and serviced on time	63(61%)	22 (21%)	18(18%)

About 60 (58%) of the respondents said they agreed with the policies and guidelines in place for CLABSI management while 23 (23%) reported disagreement. Of the nurses 60 (58%) were in agreement with policies and guidelines are in place for urine catheter management while 21 (20%) were not in agreement. A remarkable 87 (84%) of the nurses' reported urine catheters are inserted as aseptic procedure according to the guidelines and only 2 (2%) thought otherwise. Most of the respondents 72 (70%) were in agreement with policies and guidelines put in place for pressure ulcer management while 13 (13%) did not agree. A majority 63 (61%) of the nurses reported the equipment were repaired and serviced in time thus expressing agreement with the leadership around the same.

*D. Nurses' perception on the quality of patient care in the selected County CCUs in Kenya*

The nurses' perspectives on quality of care were assessed on common practices in the CCUs towards achievement of selected quality bundles (VAP bundles, CLABSI bundles, UTI bundle and Pressure ulcer bundle). From the findings, 87 (84%)

of the respondents disagreed that oral care was routinely and effectively done in the CCU. Majority 91 (88%) of the respondents also disagreed that Prophylactic Antibiotic are given early on mechanical ventilation. A high percentage of the respondents 96 (93%) disagreed that central line catheters were inserted in ideal environment with aseptic procedure followed. CVC dressing was thought not to be standard by a majority 89 (86%) of the respondents. Most of the respondents 67 (65%) confirmed that urine catheters were not removed every seven days. About 49 (48%) of the respondents' concurred that aseptic procedure was not always adhered to when in contact with a urinary catheter in the unit where else 39 (38%). The practice of 2hrly patient turning was not a largely practiced role with 57 (55%) practicing it. A majority of the respondents 69 (61%) reported that pressure ulcer risk assessment was not done every change of shift. Of the nurses' 52 (50%) didn't ascertain that moisture and incontinence checks are not often done when one is in contact with patient to help curb pressure sores and infection.

Table 4  
Nurses' perception on the quality of patient care in the selected County CCUs in Kenya

Nurses' perception of patient care	Agree	Neutral	Disagree
Oral care is routinely and effectively done in the unit	9 (9%)	7 (7%)	87 (84%)
Prophylactic Antibiotic are given early on mechanical ventilation	5 (5%)	7 (7%)	91 (88%)
Central line catheter are inserted in ideal environment with aseptic procedure followed	3 (3%)	4 (4%)	96 (93%)
CVC dressing is standard	4 (4%)	10 (10%)	89 (86%)
Urine catheters are removed every seven days	10 (10%)	26 (25%)	67 (65%)
Aseptic procedure is not always adhered to when in contact with a urinary catheter by nurses in the unit	49 (48%)	15 (15%)	39 (38%)
Turning of patient is done 2 hourly	22 (21%)	24 (23%)	57 (55%)
Pressure ulcer risk assessment is done every change of shift	39 (30%)	20 (16%)	69 (61%)
Moisture and incontinence checks are not always done one contact with patient.	52 (50%)	19 (18%)	32 (31%)

Table 5  
Association between nurses' characteristics and nurses' perception quality of nursing care (CHI – Square: p<0.05)

Demographic characteristics	Perception of Quality patient care		P-value
	Good quality n (%)	Poor quality n (%)	
Age of Nurse	21-30 years	4(11.8)	15(21.7)
	31-40	19(55.9)	29(42)
	41-50	11(32.4)	17(24.6)
	51 years above	0	8(11.6)
Gender of respondent	Male	6(17.6)	18(26.1)
	Female	28(82.4)	51(73.9)
Religion of nurse	Muslim	0	1(1.4)
	Christian	34(100)	68(98.6)
Years worked in ICU	less than 1 year	17(50)	22(31.9)
	2-5 years	15(44.1)	20(29)
	6-10 years	2(5.9)	11(15.9)
	11-15	0	11(15.9)
	16 years and above	0	5(7.2)
Level of education	Higher diploma	23(67.6)	41(59.4)
	certificate	1(2.9)	0
	Diploma	5(14.7)	14(20.3)
	Degree	5(14.7)	14(20.3)
Have you specialised in ICU	Yes	28(84.8)	44(63.8)
	No	5(15.2)	25(36.2)
Time practised post specialization	Less than 1 year	23(67.6)	33(47.8)
	2-5 years	6(17.6)	27(39.1)
	6-10	4(11.8)	6(8.7)
	11 years and above	1(2.9)	3(4.3)
Nursing cadre	ACN	4(11.8)	3(4.3)
	SNO	1(2.9)	7(10.1)
	NO1	5(14.7)	19(27.5)
	NO2	18(52.9)	10(14.5)
	NO3	6(17.6)	22(31.9)
	ECNO	0	8(11.6)

*E. Association between nurses' characteristics and nurses' perception of quality patient care*

Test for association (Chi-square) was conducted to investigate demographic characteristics and nurses' perception of quality of patient care. The analysis revealed that years worked in ICU ( $p < 0.001$ ), specialization in ICU ( $p = 0.023$ ) and nursing cadre ( $p < 0.001$ ) were significantly associated with the nurses' perception of quality patient care.

*F. The association between nurse resource satisfaction and the nurses' perception of quality patient care provided in selected county CCUs in Kenya*

In investigating the association between nurses' resource satisfaction and the nurses' quality patient care provided using chi-square, the findings revealed that all institutional factors assessed were significantly associated with the nurses' perception of quality patient care ( $p < 0.001$ ) apart from multidisciplinary teamwork in the unit where there was no

Table 6  
The association between nurses' resource satisfaction and the nurses' perception of quality patient care provided in selected county CCUs in Kenya

Nurses' resource satisfaction	Perception of Quality patient care		P-value
	Good quality n (%)	Poor quality n (%)	
Nurse patient ratio in the unit	Satisfied	13(38.2)	0
	Neutral	8(23.5)	13(18.8)
	Dissatisfied	13(38.2)	56(81.2)
Availability of consumables for provision of quality care	Satisfied	15(44.1)	11(15.9)
	Neutral	4(11.8)	25(36.2)
	Dissatisfied	15(44.1)	33(47.8)
The equipment for cardiopulmonary management in the unit	Satisfied	34(100)	12(17.4)
	Neutral	0	30(43.5)
	Dissatisfied	0	27(39.1)
Multidisciplinary teamwork in the unit	Satisfied	20(58.8)	41(59.4)
	Neutral	12(35.3)	17(24.6)
	Dissatisfied	2(5.9)	11(15.9)
All the consumables/resources for VAP management are readily available.	Satisfied	30(88.2)	25(36.2)
	Neutral	2(5.9)	21(30.4)
	Dissatisfied	2(5.9)	23(33.3)
All the consumables/resources for CLABSI management are available in time	Satisfied	23(67.6)	22(31.9)
	Neutral	11(32.4)	19(27.5)
	Dissatisfied	0	28(40.6)
All the consumables/resources for urine catheter management are available in time.	Satisfied	34(100)	20(29)
	Neutral	0	26(37.7)
	Dissatisfied	0	23(33.3)
Ripple mattress for pressure ulcer management are available	Satisfied	34(100)	53(76.8)
	Neutral	0	14(20.3)
	Dissatisfied	0	2(2.9)
There is adequate PPEs for patient management	Satisfied	33(97.1)	58(84.1)
	Neutral	0	6(8.7)
	Dissatisfied	1(2.9)	5(7.2)
Equipment are repaired and serviced on time	Satisfied	29(85.3)	29(42)
	Neutral	4(11.8)	22(31.9)
	Dissatisfied	1(2.9)	18(26.1)

CHI – Square:  $p < 0.05$

Table 7  
Association between policy and guidelines agreement and nurses' perception of quality care

Nurse policy and guidelines agreement	Perception of Quality patient care		p-value
	Good quality n (%)	Poor quality n (%)	
Policies and guidelines are in place for VAP management	Agree	34(100)	30(43.5)
	Neutral	0	19(27.5)
	Disagree	0	20(29)
I am satisfied with the policies and guidelines in place for CLABSI management	Agree	34(100)	26(37.7)
	Neutral	0	20(29)
	Disagree	0	23(33.3)
Policies and guidelines are in place for urine catheter management	Agree	27(79.4)	33(47.8)
	Neutral	3(8.8)	19(27.5)
	Disagree	4(11.8)	17(24.6)
Urine catheters are inserted as aseptic procedure	Agree	34(100)	53(76.8)
	Neutral	0	14(20.3)
	Disagree	0	2(2.9)
Policies and guidelines are in place for pressure ulcer management	Agree	29(85.3)	38(55.1)
	Neutral	3(8.8)	18(26.1)
	Disagree	2(5.9)	13(18.8)
Equipment are repaired and serviced on time	Agree	29(85.3)	29(42)
	Neutral	4(11.8)	22(31.9)
	Disagree	1(2.9)	18(26.1)

CHI – Square:  $p < 0.05$

association found (p =0.253).

**G. Association between policy and guidelines agreement and nurses' quality patient care**

The study also investigated the policy and guidelines agreement among respondents using chi-square test of association. The results established that there was statistically significant association between all policy guidelines investigated and quality of nursing care (p<0.001).

logistic regression was used to determine the predictors of the perceptions of quality patient care. The model revealed that years of experience in ICU, specialized in ICU, adherence to aseptic procedure, moisture and incontinence checks and availability of VAP management resources were independently associated with the nurses' perception of quality patient care. Respondents who had 2 – 10 years of experience were 0.1 times less likely to have good perception of quality patient care, (aOR = 0.1, 95%CI: 0.02,0.48, p<0.05). Respondents who had specialized in ICU were three times more likely to have good perception of quality patient care compared to those without specialization in ICU, (aOR =3.18,95%CI:1.09,9.28, p =0.034). Respondents who were neutral to the statement that aseptic procedure is not always adhered to when in contact with a urinary catheter by nurses in the unit were 0.06 times less likely to have good perception of quality patient care compared to those who agreed with the statement, (aOR =0.06, 95%CI: 0.02,0.23, p<0.001). Respondents who were neutral to the statement that, moisture and incontinence checks are not always done when contact with patient were 0.04 times less likely to have good perception of quality patient care, (aOR =0.04, 95%CI:0.01, 0.13, p<0.001), those who disagreed with the statement were 0.12 times less likely to have good perception of quality patient care compared to those who agreed with the statement, (aOR =0.12, 95%CI: 0.03, 0.45, p = 0.002). The findings also revealed that, respondents who agreed with the

statement that all the consumables/resources for VAP management are readily available were 0.29 times less likely to have good perception of quality patient care compared to those who disagreed with the statement, (aOR= 0.29, 95%CI: 0.09, 0.99, p =0.042).

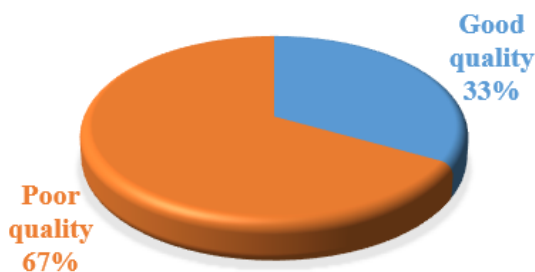


Fig. 1. Nurses' perception of patient care in the selected county CCUs

**4. Discussion**

The findings in this study depicted a middle aged (30-40years) but a less experienced population as opposed to a study by Eltaybani et al. (2021) that depicted a more youthful nursing population but a more experienced population. This is suggestive of a nursing population that specialize in CCU later on in their carrier and not immediately after completion of basic training in nursing. The majority of the nurses were female which is related to a study by Clavero et al. (2020) that stated that female gender account for the bigger percentage of the nursing fraternity. This finding affirm that the female gender is still dominant in critical care nursing as it is in the rest of the nursing subspecialties. More than two third of the nurses' population in the units were critical care trained which was similar to a study by Ochoki et al. (2021) which reported majority of the nurses working in the CCU to be CCU trained. CCU training is seen as fundamental to working in a CCU although not all nurses working in the CCU are critical care

Table 8  
Independent factors association with nurses perception of quality of patient care

Determinants	B	S.E.	aOR(95%CI)	P-value
<b>Years of experience in ICU</b>				
Less than 1 year			1	
2-5 years	-2.345	0.801	0.1(0.02,0.46)	0.003
6-10 years	-2.315	0.809	0.1(0.02,0.48)	0.004
<b>Have you specialised in ICU</b>				
Yes	1.157	0.546	3.18(1.09,9.28)	0.034
No				
<b>Aseptic procedure is not always adhered to when in contact with a urinary catheter by nurses in the unit</b>				
Agree			1	
Neutral	-2.773	0.667	0.06(0.02,0.23)	<0.001
Disagree	-1.099	0.882	0.33(0.06,1.88)	0.213
<b>Moisture and incontinence checks are not always done when contact with patient</b>				
Agree			1	
Neutral	-3.273	0.645	0.04(0.01,0.13)	<0.001
Disagree	-2.166	0.698	0.12(0.03,0.45)	0.002
<b>Availability of consumables for provision of quality care</b>				
Agree			1	
Neutral	-1.099	0.505	0.33(0.12,1.90)	0.291
Disagree	1.044	0.622	2.84(0.84,9.62)	0.093
<b>All the consumables/resources for VAP management are readily available</b>				
Agree	-1.25	0.613	0.29(0.09,0.99)	0.042
Neutral	0.399	0.834	1.49(0.29,7.63)	0.632
Disagree			1	

nursing trained especially in the African setup (Clavero *et al.*, 2020; Eltaybani *et al.*, 2021; Ochoki *et al.*, 2021).

In this study the nurses were dissatisfied with the nurse patient ratio. The nurse to patient ratio has been a challenge in many intensive care units as studies have depicted. This is the case in many resource strained settings. In most of this settings nurses have to care for more patients than the ideal ratio often leading to ratio dissatisfaction and at times burnout (Raurell-Torredà, 2020; Sattar *et al.*, 2019; Storm & Chen, 2021). Nurses in the study were not satisfied with the availability of resources to give quality care which was also seen in a study Supady *et al.* (2021) in times of Covid 19 pandemic as resources were scares or over used due to the high number of patients than budgeted for. This study was conducted at time when COVID 19 was rampant in the country and could be said to contribute to the finding on resources. Nurses in this study were satisfied with equipment for cardiopulmonary management. Better cardiopulmonary resources management improve the outcome of the patient hence promote nurse resource satisfaction as this study was synonymous to a study by Talle *et al.* (2018) in term of nurse satisfaction to cardiopulmonary management resources where the availability could have been said to the control of cardiopulmonary related deaths (Talle *et al.*, 2018).

Nurses' access to resources has always been key in the ICU and the availability of consumables for management of various issues like CLABSI, VAP, UTI and pressure ulcers. The selected counties did their level best to satisfy this resource demands for nurses as the nurses' response indicated so which is comparable to a study by Booraphun (2021) that showed implementation of a sepsis management module in a resource limited setting increased survival rates in patients in the ICU (Booraphun *et al.*, 2021). Multidisciplinary teamwork in the ICU has always been encouraged as this promotes better patient outcomes, this factor was satisfactory to the nurses in this study. Teamwork is seen to improve CCU outcomes (Cleeve *et al.*, 2020).

Policies and guidelines are essential in the provision of quality care of a patient. The majority of the nurses were satisfied with policies in place for management of healthcare related infections (VAP, CLABSI, UTI and pressure ulcers) which is comparable to a study that outlined that guidelines are important to the reduction of healthcare outcomes. Policies and their adherence were of importance to institutionalize quality improvement and patient safety practices in health care. What the leadership does to affirm the indexed guidelines to care is of importance to the perception of care hence reduction of healthcare adverse outcomes (El-Jardali & Fadlallah, 2017).

In this study nurses were in agreement with policies and guidelines in place for management of: VAP, CLABSI, UTI and pressure ulcers. Where there was a perceived cultivated support to policies and contextual factors towards quality delivery meet the nurses were hence satisfied and hence delivered quality care. Motivation from these structures could be said to impact greatly to the association between nurses' perception of quality and the characteristics surrounding the delivery of quality patient care (Shirey, 2017).

Equipment repair and servicing is also very essential and this

was seen to be satisfactory to the nurses' in this study. Studies have concluded that good ICU equipment management can reduce failure and maintenance cost and hence improve quality of care delivery (Shaoman *et al.*, 2020).

The nurse experience, specialization status and cadre are very important to determine the quality of nursing care offered as discussed by studies (Egerod *et al.*, 2021; Lakanmaa *et al.*, 2015). This study found the three significant, which further adds to the strength of that body of knowledge. In most cases experience, cadre and specialization add to competency of an advanced nurse, which improve the quality of nursing care offered. This was greatly put by Hussein and Alrubaiee (2020) study that reported the significance of nurse experience and specialization towards the achievement of enteral nutrition. The less the experience and lack of specialization the poorer the outcomes of quality of care (Egerod *et al.*, 2021; Hussein & Alrubaiee, 2020).

Nursing resources like staffing ratios were significant in this study which is concurrently with a study by Rae *et al.* (2021) that highlighted a more than 200% increase in sepsis with poor staffing. Sepsis has been reported in the Kenyan national referral system to be significant which could lead to the assumption that staffing ratios was a contributing factor. Nurses' pressure ulcer relieving resources and management in this study was significant in a study by Asmare *et al.* (2020) stated how such an association lead to decreased pressure ulcers. The nurses' perception was that turning was done effectively, incontinence checks were done effectively and pressure ulcer risk assessment done effectively which could be said to contribute greatly to the low-pressure ulcer rates. This study found out that nurses' perception to UTI resources and management was significant which was concurrent with a study by Jennifer (2021) that stated the weight of resources needed in management of UTIs and prevention of readmission. Availability of resources for UTI management could be said to contribute to the low UTI rates in the units. (Asmare *et al.*, 2020; Rae *et al.*, 2021; S *et al.*, 2021)

In this study institutional policies and guidelines were found to be significant contradicting a study by Steenkiste *et al.* (2021) that found the number of policy implementation strategies were not significantly associated with quality indicators. Policy and guidelines were found to influence sepsis as an African study agreed that guidelines were essential to sepsis management (Waweru & Chokwe, 2015). Policies and guidelines to were significant in the study to pressure ulcers and UTI management as literature has ascertain how well guidelines can control Urinary tract infections and pressure ulcers (Halász *et al.*, 2021; Snyder *et al.*, 2021). Policies and guidelines in the CCU are essential in the management and achievement of quality nursing care (Chamberlain *et al.*, 2018; Njau *et al.*, 2019; Steenkiste *et al.*, 2021).

The study revealed that: years of experience in ICU, specialized in ICU, adherence to aseptic procedure, moisture and incontinence checks and availability of VAP management resources were independently associated with the perception of quality patient care. This is synonymous to multiple studies that independently reported the above contributors to quality of



nursing care in the CCU (Despins et al., 2019; Filkins, 2017; He et al., 2016; Ongóndi et al., 2016; Snyder et al., 2021). It can be assumed that the institution controls the factors surrounding quality of care delivery is essential towards influencing quality patient care. The competency of the nurse and experience in the unit was justified to how they delivered and perceived care and the skillset brought in through such systems as aseptic procedures and quality checks would be said to be improved through training and knowing what to adequately check for.

## 5. Conclusion

The nurses' perception of quality of patients care in the selected county CCUs was below average. The nurses' experience, specialization status and cadre are significantly associated with the perception of quality of patient care. Resource satisfaction was significant associated to the nurses' perception of quality of patient care. Policies and guidelines were significant associated to nurses' perceptions to quality of patients' care. Predictors: experience in ICU, ICU specialization, adherence to aseptic procedure and availability of VAP management resources were independently associated to perceptions of quality of patient care.

## 6. Relevance to Clinical Practice

To improve the quality of care the county government is encouraged put more emphasis on the factors influencing the nurse working in the CCUs for instance nurse patient ratio and uphold the satisfactory resources provided to the nurses. The county government and the hospital administration are recommended to consider CCU specialization, the years of experience in CCUs and the nursing cadre when employing nurses working in the CCUs. The county government is encouraged to improve on facilitation of resources for VAP, CLABSI UTI and Pressure ulcer management to promote ease of patient care in the different ICUs. The county governments are recommended to put more resources to control: years of experience in ICU, specialization in CCU, adherence to aseptic procedure, moisture and incontinence checks and availability of VAP management resources were independently associated with the perception of quality patient care.

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