



## ORIGINAL ARTICLE

## Self-assessed competencies of nurses at an emergency department in Ghana

Victoria Bam<sup>a,\*</sup>, Abigail Kusi-Amponsah Diji<sup>a</sup>, Ernest Asante<sup>a</sup>, Alberta Yemotsoo Lomotey<sup>a</sup>, Pearl Adade<sup>a,b</sup>, Berlinda Asante Akyeampong<sup>a,b</sup>

<sup>a</sup> Department of Nursing, Kwame Nkrumah University of Science and Technology, Ghana

<sup>b</sup> Korle Bu Teaching Hospital, Accra, Ghana

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## ABSTRACT

**Introduction:** The nature and scope of emergency nursing exposes nurses to a wide array of patient populations with rapidly changing and unexpected clinical conditions, sophisticated logistics and procedures. Hence, emergency centre (EC) nurses ought to be ready to face diverse clinical challenges and deliver care to patients in a timely cost-effective manner and with the needed competence. The current study aimed at examining the self-assessed competencies of nurses, and comparing ratings among certified emergency nurses (ENs) and general nurses (GNs) working at an EC of a tertiary hospital in Ghana.

**Methods:** A descriptive cross-sectional quantitative study was carried out among 109 conveniently sampled nurses. Participants evaluated their perceived competencies on a validated instrument under five domains, namely: diagnostic function (DF), administering and monitoring therapeutic interventions (AMTI), effective management of rapidly changing situations (EMRCS), organisational and work load competency (OWLC), and the helping role (HR). Descriptive and inferential data analyses were by SPSS version 25.

**Results:** Participants generally had good competencies in the performance of emergency nursing procedures. Highest scores were obtained in OWLC (median score of 83.3%) while EMRCS recorded the least scores (median score of 57.9%). With the exception of the DF domain ( $p = 0.166$ ), ENs perceived themselves as significantly more competent than their counterpart GNs in 4 (OWLC, HR, AMTI, EMRCS) out of the five studied domains ( $p < 0.05$ ).

**Discussion:** Specialist training enhances nurses' perceived competences in emergency nursing procedures. This reiterates the need for regular theory and practice-based education for GNs on intermediate and advanced procedures as they prepare to enrol in specialist programmes. As nurses take on expanded professional roles in this emerging nursing specialty in low- and middle-income countries, it is important the needed capacity is developed to adequately address the needs of patients and families that require services in ECs.

## African relevance

- No previous studies have comprehensively described the competencies of nurses working at an African EC; specifically, none in Ghana.
- The study may help guide training of general nurses on emergency nursing procedures.
- Continued advocacy for the training of emergency nursing specialists in resource-constrained settings.
- Attention to optimising emergency nursing skills in West Africa is required.

## Introduction

Competency, as a general term, eludes a unified definition due to varied opinions shared by experts in the field. In the context of nursing, competency has been defined as putting up expected and measurable levels of performance through the integration of knowledge, skills, abilities and judgement grounded in scientific knowledge and nursing practice principles [1]. In support of this, the Emergency Nurses Association [2] has also described competency as serving an individual or a community through the habitual and judicious use of knowledge, technical skills, clinical reasoning, emotional intelligence, values and reflection in daily practice.

There are varied ways of measuring competencies in nursing. Common methods include: written and oral examinations, chart

\* Corresponding author.

E-mail addresses: [vbbam.chs@knust.edu.gh](mailto:vbbam.chs@knust.edu.gh) (V. Bam), [akamponsah.fahs@knust.edu.gh](mailto:akamponsah.fahs@knust.edu.gh), [abkuam@utu.fi](mailto:abkuam@utu.fi) (A.K.-A. Diji).

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reviews, skill validation checklists, objective structured clinical examination (OSCE), supervisory performance appraisals [3], clinical simulations [4], professional portfolios [5] and certifications [6].

Emphasis has been placed on competency in nursing as it equips practitioners with essential knowledge, attitudes and skills to make decisions and solve problems using sound clinical judgment, the best research evidence and patient preferences [7]. Apart from serving as a benchmark in the nursing profession, competencies ensure that nurses perform expected tasks to successful completion with desirable results [8] while avoiding disciplinary sanctions and legal litigations [9]. Competence has also been shown to lead to safe, ethical, cost-effective and high-quality healthcare [10,11]. Nurses therefore owe a duty to themselves, their profession and the public to be self-aware and continually take steps to maintain and demonstrate competence throughout their career [1,2].

Nurses serve as the frontline providers in the emergency centre (EC); this is because they generally comprise the bulk of healthcare professionals and provide care on a 24-hour basis for patients at a critical phase of illness or injury [12]. The nature and scope of emergency nursing practice exposes practitioners to a wide array of patient populations with rapidly changing and unexpected clinical conditions, sophisticated logistics and procedures [13]. Thus, EC nurses ought to be ready to face diverse clinical challenges and deliver care to patients in a timely, cost-effective manner and with the needed competence.

Emergency care systems in Ghana and other low- and middle-income countries (LMICs) are suboptimal when compared with those in higher-income regions [14]. There are insufficient numbers of skilled emergency nursing professionals [15] and those that exist are overloaded with the management of high patient volumes. When patients arrive at ECs, they are often very ill, as they have delayed seeking healthcare until in dire condition [16]. These challenges, amongst many others, easily lead to staff burnout and stress on already sub-optimal emergency care systems in nations such as Ghana.

Following the establishment of an EC in a tertiary hospital in Ghana in 2009, the country continued building emergency care capacity by training emergency healthcare practitioners, including nurses. A needs assessment was conducted to identify gaps in nursing knowledge and skills [15]; this led to the development of a responsive curriculum for training emergency nursing professionals. In addition, the emergency nursing training programme incorporated a training-of-trainers model to enhance sustainability and in-country retention. Since the inception of the programme, 257 emergency nurses (ENs) have successfully graduated; these providers now work in various healthcare facilities in diverse geographic locations in Ghana and beyond. Nonetheless, ECs in Ghana are still being manned by both specialist and general nurses (GNs) due to insufficient numbers of ENs alongside ever-increasing patient numbers and workload.

Although a number of studies have assessed clinical nursing competencies, there is limited evidence on the assessment of competencies in emergency nursing procedures [17–20] and much of that evidence is based in regions with higher income levels than Ghana [17–20]; these countries have different healthcare environments and dynamics than that of Ghana. This study sought to assess the perceived competencies of nurses working at an EC in a tertiary healthcare facility. In addition, it aimed to compare emergency nursing competencies among certified ENs and GNs working at the department.

## Methods

This study was carried out at a 120-bed capacity EC located within a 1246-bed public tertiary level teaching hospital in Ghana. This setting is one of the few structured ECs in Ghana and at the time of the study, it served as the main centre for the formal training of specialist ENs; it is also where the largest proportion of the certified ENs in Ghana are concentrated. The EC is divided into nine units. Following triage, patients are admitted into three main areas depending on the severity of

their respective conditions. The red unit has a bed capacity of seven and admits only seriously ill or injured patients in need of immediate care; the 12-bed orange unit accepts patients who need very urgent care; the 18-bed yellow unit is designated for patients who need urgent care. Patients might also be admitted to the Critical Deciding Unit (CDU) and other ancillary facilities. It is important to note that, after triage and stabilisation, obstetric patients are transferred to the obstetrics and gynaecology department in a different area of the hospital. Paediatric patients are diverted to a separate Paediatric Emergency Unit.

In 2017, 20,798 cases were triaged, 15,990 of these were admitted, with a daily average of 44 patients [21]. The EC unit admits adults with varied life-threatening conditions, including traumatic injuries and obstetric emergencies. Many admitted patients stay beyond the 24-hour target in the EC due to shortages of beds in the hospital's main wards. The average length of stay in the EC is seven days, with shorter durations of two to three days in the yellow and red units, and longer durations in the CDU. These longer stays create congestion in the EC resulting in an average nurse:patient ratio of 1:6.

In the EC setting used for this study, there are different categories of nurses, including professional and auxiliary nurses. Among the professional nurses are two groups: certified ENs who have been licensed by the Nursing and Midwifery Council of Ghana and registered nurses with no certification in emergency nursing, known as GNs. The ENs have undertaken a structured academic and professional programme in emergency nursing at the diploma (one year) or degree (two years) level. As at the time of this study, the EC was being manned on a three-tier shift system (morning, afternoon and night) by 170 professional nurses, comprising certified ENs and GNs. Of this population, 70 of them were ENs. The nurses' professional ranks were staff nurse (SN), senior staff nurse (SSN), nursing officer (NO), senior nursing officer (SNO) and principal nursing officer (PNO). In Ghana, nurses who work in the public (government) sector work full-time and all the nurses in the EC are full-time employees of the hospital. Nurses working in the red, orange and yellow units served as the study population; these units were chosen because this is where most of the ENs work within the EC. Participants were recruited if they were professional nurses and had worked at the EC for a minimum period of one year, as this was considered appropriate for evaluating one's competencies. Auxiliary nurses, student nurses, professional nurses on rotation and nurses with less than one year of work experience in the EC were excluded.

A descriptive, cross-sectional, quantitative study design was carried out to evaluate EC nurses' self-assessed competencies.

The sample size for the study was determined using Taro Yamane's formulae [19], used because the total EN population was not large enough for meaningful random manipulations. The total number of eligible participants was 150 and the margin of error was set at 5%, producing a required sample size of 109 at 95% confidence interval. With the inclusion of a ten percent non-response rate, the targeted total sample size was 120.

Following approval by the hospital, the EC provided a list of the nurses who work in the unit with indication of whether they were professional nurses or auxiliary nurses. Convenience sampling was used to identify participants. Eligible participants signed on a separate register which was kept by the researchers to prevent double participation. Two researchers, who do not work in the EC, approached nurses (GNs and ENs) at the EC and explained the study's purpose, benefits, risks and the voluntary nature of their participation. The participants were assured of confidentiality of the data and protection of their identity hence they were not expected to indicate their names on the questionnaire. Nurses who consented to participate and met the study inclusion criteria were given the survey instrument, which took between 20 and 30 min to complete. Participants completed the self-administered questionnaire. Completion and submission of the questionnaires by the participants served as evidence for obtaining informed consent. Participants provided their demographic information and rated their perceived competencies without revealing their names on the

questionnaires.

The data collection instrument used in the current study was adapted from McCarthy et al.'s study [17] after obtaining permission from the authors. This instrument was used as it captured the tasks expected of nurses working in the ECs of Ghanaian hospitals. One question (i.e., prescribing medications) was amended to “interpreting medications” to reflect current practice in Ghana, as nurses are not mandated to do this in their scope of practice. The 119-item instrument had been previously validated by a panel of experts in Ireland; Cronbach's alpha has been reported to be 0.98, signifying a high level of internal consistency [17]. Prior to the instrument's usage in Ghana, its face validity was assessed by three emergency care experts (two in Ghana and one from the United States of America, with experiences in the Ghanaian emergency care setting). The instrument was comprised of five domains: diagnostic function (DF) (18 items), administering and monitoring therapeutic interventions (AMTI) (43 items), effective management of rapidly changing situations (EMRCS) (19 items), organisational and work load competencies (OWLC) (22 items), and the helping role (HR) (17 items).

Each item on the instrument was assessed using a 4-point Likert scaled options from 1 through 4 where 1 meant “no competence”, 2 “limited competence”, 3 “moderate competence”, and 4 “high competence”. The minimum score on the entire instrument is 119 with a maximum score of 476. Domains were also summed together. For instance, the diagnostic function domain had a minimum score of 18 and a maximum score of 72. The summated scores of each domain and the entire instrument were converted into 100% for comparison purposes using the formulae:

%Competence = (achieved score – number of items in the domain)

$$* \frac{100}{DF},$$

where DF is difference between the maximum and minimum attainable score in the domain.

As ranked by Hassankhani et al. [18] in their study, the perceived competencies in each domain and the entire instrument were classified as follows: weak (0–24), intermediate (25–49), good (50–74), and very good (75–100).

Data were entered and cleaned on Microsoft Excel before being exported into IBM Statistical Package for Social Sciences (SPSS) version 25 for further analysis. Continuous variables were presented using medians and ranges due to skewed data distribution. Categorical variables were described using frequencies and percentages. Chi-square test of independence was used to examine the association between the categorical variables and their statistical significance when cell counts within each cell were  $\geq 5$ . Fisher's exact test using the Monte Carlo's approach was also conducted for tables that were larger than  $2 \times 2$  and with cell counts  $< 5$ . Mann–Whitney *U* test was used in examining the competencies among the two groups (ENs and GNs) since the data did not meet the requirements for parametric testing. Statistical significance for all tests was set at an alpha of 0.05.

Prior to the commencement of the study, ethical approval with reference number CHRPE/AP/198/17 was obtained from the Committee on Human Research, Publication and Ethics, School of Medical Sciences, Kwame Nkrumah University of Science and Technology following administrative approval from the Research and Development Unit of the hospital. Participants were assured of confidentiality, anonymity, privacy, and their right to withdraw from the study without having to explain themselves nor receive any penalties for doing so. Participants' data were accessible to only the researchers involved in the current study.

## Results

130 nurses were approached through convenience sampling

**Table 1**  
Demographic characteristics of participants (n = 109).

Variable	Total (n = 109) n (%)	ENs (n = 45) n (%)	GNs (n = 64) n (%)	p value
Age (years) <sup>†</sup>				
20–29	23 (21.1)	11 (24.4)	12 (18.7)	0.624
30–39	83 (76.2)	34 (75.6)	49 (76.6)	
40–49	2 (1.8)	–	2 (3.1)	
$\geq 50$	1 (0.9)	–	1 (1.6)	
Gender <sup>‡</sup>				
Male	28 (25.7)	10 (22.2)	18 (28.1)	0.487
Female	81 (74.3)	35 (77.8)	46 (71.9)	
Educational qualification in nursing <sup>†</sup>				
Diploma	49 (45.0)	22 (48.9)	27 (42.2)	0.569
Degree	55 (50.4)	22 (48.9)	33 (51.6)	
Postgraduate	5 (4.6)	1 (2.2)	4 (6.2)	
Professional rank <sup>†</sup>				
SN	21 (19.3)	13 (28.9)	8 (12.5)	0.028*
SSN	31 (28.4)	8 (17.7)	23 (35.9)	
NO	21 (19.3)	12 (26.7)	9 (14.1)	
SNO	35 (32.1)	12 (26.7)	23 (35.9)	
PNO	1 (0.9)	–	1 (1.6)	
Working years in the emergency centre <sup>†</sup>				
1–2	14 (12.9)	11 (24.4)	3 (4.7)	0.018*
3–4	18 (16.5)	5 (11.1)	13 (20.3)	
5–6	29 (26.6)	12 (26.7)	17 (26.6)	
7–8	48 (44.0)	17 (37.8)	31 (48.4)	
Working unit in the emergency centre <sup>‡</sup>				
Red	33 (30.3)	16 (35.6)	17 (26.6)	0.210
Orange	37 (33.9)	11 (24.4)	26 (40.6)	
Yellow	39 (35.8)	18 (40.0)	21 (32.8)	

Note. ENs, emergency nurses; GNs, general nurses; SN, staff nurse; SSN, senior staff nurse; NO, nursing officer; SNO, senior nursing officer; PNO, principal nursing officer.

<sup>†</sup> Variables analysed using Fisher's exact test (F).

<sup>‡</sup> Variables analysed using chi-square test ( $\chi^2$ ).

\* Indicates statistical significance.

between April and May 2017. 109 (45 ENs and 64 GNs) answered and returned the questionnaires, yielding a response rate of 83.8%.

As illustrated in Table 1, the majority of the participants (n = 81, 74.3%) were female, and 83 (76.2%) were aged 30–39 years. About 60 (55.0%) had received a minimum of an undergraduate degree qualification, and 57 (52.3%) were occupying senior professional ranks (from NO rank upwards). Seventy-seven (70.6%) of the participants had worked in the EC for a minimum of five years. Participants were almost equally distributed in the red, orange and yellow units of the EC; 33 (30.3%), 37 (33.9%) and 39 (35.8%), respectively. Apart from the professional rank and the working years in the EC, there was no statistically significant differences in the sociodemographic characteristics of either group (ENs and GNs).

The overall median reported competency in the performance of emergency nursing procedures was 67.8% (Table 2). The topmost competency area was in the domain of OWLC (median score of 83.3%) followed by DF (median score of 75.9%). Participants had the lowest score in the domain of EMRCS (median score of 57.9%), followed by that of administering and monitoring therapeutic interventions (62.0%).

Overall competency in emergency nursing procedures was significantly greater for the ENs (median = 74.0%) than for GNs (median = 65.0%) ( $U = 958, p = 0.003$ ). With regard to each of the five competency domains, ENs had higher scores than their counterpart GNs. Nevertheless, the difference between the ENs (median = 77.8%) and the GNs (median = 72.2%) was not statistically significant ( $U = 1215.5, p = 0.166$ ) in the DF domain. ENs assessed themselves significantly more competent than GNs in the other four domains: EMRCS (median difference of 10.5%,  $U = 969.5, p = 0.004$ ), HR

**Table 2**  
Participants' competencies in emergency nursing procedures (n = 109)

Competency domain	Total (n = 109)	ENs (n = 45)	GNs (n = 64)	<i>U</i>	<i>p</i> value
Organisational and work load competencies				1110.5	0.042*
% median	83.3	86.4	81.8		
(Range)	(19.7–100.0)	(53.0–100.0)	(19.7–100.0)		
Diagnostic functions				1215.5	0.166
% median	75.9	77.8	72.2		
(Range)	(18.5–96.3)	(53.7–96.3)	(18.5–96.3)		
Helping role				997.5	0.006*
% median	66.7	74.5	66.7		
(Range)	(7.8–100.0)	(39.2–100.0)	(7.8–100.0)		
Administering and monitoring therapeutic interventions				949.5	0.003*
% median	62.0	64.34	57.4		
(Range)	(30.2–93.8)	(34.9–91.5)	(30.2–93.8)		
Effective management of rapidly changing situations				969.5	0.004*
% median	57.9	66.7	56.1		
(Range)	(10.5–94.7)	(10.5–94.7)	(28.1–94.7)		
Overall competency				958.0	0.003*
% median	67.8	73.9	64.9		
(Range)	(39.8–93.8)	(43.1–93.8)	(39.8–93.8)		

Note. ENs, emergency nurses; GNs, general nurses; *U*, Mann–Whitney *U* test results.

\* Indicates statistical significance.

(median difference of 7.8%,  $U = 997.5$ ,  $p = 0.003$ ), AMTI (median difference of 7.0%,  $U = 949.5$ ,  $p = 0.003$ ) and OWLC (median difference of 4.5%,  $U = 1110.5$ ,  $p = 0.042$ ).

## Discussion

It was the aim of this study to evaluate the self-perceived competencies of nurses on emergency nursing procedures and to also compare ratings between ENs and GNs. Participants in the current study generally rated themselves as having good competencies in the performance of emergency nursing procedures. This implies that the nurses largely perceived themselves as confident, knowledgeable and skilled in providing quality, safe care to EC patients as has been shown in past studies in Iran [18]. This overall self-assessed high level of competence is in contrast to the findings from South Africa [19], possibly due to the different measurement tools used. However, regarding the various levels of skills, results from the current study were similar to the findings from South Africa [19] in terms of basic skills (assessment, breathing, circulation, diagnostic, etc.) which are fundamental and the nurses implement these repeatedly and frequently thereby contributing to their perceived competency in these areas. The differences and similarities could also be due to differences in the level of training in emergency nursing, which has not been provided in the studies by Hassankani et al. [18] and Dulas and Brysiewicz [19].

Consistent with the results of previous studies in Ireland and Iran [17,18], very good competencies were perceived in the areas of OWLC as well as that of DF. This finding is not surprising as more than half of the participants were in higher professional ranks and played various leadership roles at their workplaces. Prior to the placement of nurses at the EC, they go through an orientation process of which emphasis is placed on patient assessment and triaging (which are major parts of the procedures under the diagnostic functions). Moreover, activities in the diagnostic domain are considered as basic skills [3,19] and are accentuated in both general and emergency nursing curricula in Ghana. All of these factors may account for the observed trends in the present study. Study participants, however, had the least perceived competence in EMRCS and AMTI domains. These competency domains have been indicated in previous studies [17,18] as an area of poor performance and reiterates the need for intensification of both theory and practice-based education.

ENs were generally more competent in the performance of

emergency nursing procedures compared to their GN counterparts. Significant differences were in the areas of EMRCS, HR, AMTI and OWLC. Findings from an earlier needs assessment study with nurses in the current EC setting [15], revealed their self-assessment results indicated their quest to learn and update their knowledge and skills in emergency care. The outcome of the needs assessment study contributed to the development of the curriculum for the emergency nursing programme hence the possible influence on the ENs' self-assessed competency. This calls for regular in-service training in intermediate and advanced emergency nursing procedures for the GNs whilst they are practicing in the EC even as they prepare to enrol on the specialist programme in the future. As indicated in Henrik & Kerstin's study [22], basic nursing education does not provide sufficient emergency nursing competence. This is relevant because the emergency nursing programme focuses on advanced procedures and care of specialised populations such as infants and the elderly, among others [23]. Additionally, emergency practice exposes practitioners to diverse patient groups with varied healthcare needs. It is therefore important for nurses to be equipped in all areas of care as competency has been linked to improved healthcare outcomes [10,11].

One of the items on the questionnaire – “prescribing medications” – was changed to “interpreting medications” as ENs are not permitted to play this role in clinical settings in Ghana unlike in other jurisdictions [17]. Considering the limited number of emergency physicians, emergency nursing roles should be expanded to include this function as it has been shown in previous studies that such actions lead to improved outcomes [23–25]; these include improvement in job satisfaction, quality of patient care, patient satisfaction, reduction in healthcare costs and patient waiting times.

One of the limitations of this study is the self-reported nature of the competences that were assessed as this approach is subject to response bias. Participants might have scored themselves either high or low when compared to an observation of the practices entailed in these competencies. We therefore recommend future studies to combine both subjective and objective measures of competency assessment. Also, the use of convenience sampling restricts generalisations as it has the possibility of excluding responses that could have influenced the study results in other directions. In spite of these limitations, the study findings provide evidence from an African setting and adds to the body of knowledge in this field.

The EN works in a critical environment in which competency influences the quality and safety of care delivered to patients. Although participants generally reported good competencies, ENs perceived themselves as significantly more competent than their counterpart GNs. Emergency nursing is an emerging specialty in LMICs, especially in sub-Saharan Africa. Most ECs are being manned by non-specialist nurses hence there is the need for regular in-service training in the identified competency domains for general nurses who work in ECs. As nurses take on expanded professional roles in this emerging nursing specialty, it is important the needed capacity is developed to adequately address the needs of patients and families that require services in ECs.

## Dissemination of results

Results have been shared with nursing leadership and some EC nursing staff via informal presentations.

## Authors' contributions

Authors contributed as follow to the conception or design of the work; the acquisition, analysis, or interpretation of data for the work; and drafting the work or revising it critically for important intellectual content: VB 22%; AKAD 20%; EA, PA, and BAA 15%; and AYL 13%. All authors approved the version to be published and agreed to be accountable for all aspects of the work.

## Declaration of competing interest

The authors declared no conflicts of interest.

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