Factors Influencing Nurse Interns' Competence in Physical Assessment for Adult Patients

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ABSTRACT

Context: Physical assessment is essential to the overall health assessment, constituting the nursing process's first phase. The physical assessment competence of nurse interns has been observed as insufficient in evaluating and solving patients' health problems in the clinical environment. This insufficiency has negatively influenced their ability to make better clinical decisions for patients, thus contributing to poor quality of patient care.

Aim: To investigate factors influencing nurse interns' competence in physical assessment for adult patients.

Methods: Cross-sectional analytical research design guided the conduct of the study. The sample comprised 117 nurse interns in health facilities in the Western region of Kenya. Data collection was done using a self-administered questionnaire and health assessment observation checklist. The study was done in level 5 and 6 referral hospitals in the Western region of Kenya, covering the former Western, Nyanza, and Rift-valley provinces. These comprised Kericho, Nakuru, Kitale, Kakamega, Bungoma, and Kisii County Referral hospitals; Jaramogi Oginga Odinga and Moi Teaching and Referral Hospitals.

Results: The overall assessment showed that 35% (n=41) of nurse interns were competent in physical assessment with a score of 90% and above in physical assessment skills, while 65% (n=76) were not competent. Factors that were statistically associated with higher competence scores (≥ 90%) included the year of completion between 2016 – 2019 (OR: 3.1; 95% CI [1.1-8.5]; *p*=0.02), longer internship period between 9–12 months (OR: 0.2; 95% CI [0.1-0.5]; *p*=0.0002), more than seven months previous clinical experience before internship (OR: 0.4; 95% CI [0.2-1.0]; *p*=0.05), self-confidence in performing physical assessment accurately (OR: 4.5; 95% CI [1.9-10.5]; *p*=0.003) and motivation to learn more and perform physical assessment (OR: 0.4; 95% CI [0.2-1.0]; *p*= 0.042).

Conclusion: Nurse interns' competence in physical assessment skills is low, as shown by around one-third of study participants achieving a 90% and above score. Key factors that influence physical assessment competence are the year of completion, a longer period of internship, previous clinical experience before internship, self-confidence in performing physical assessment accurately, and motivation of nurse interns to learn more and perform physical assessment. The study recommends that nurse training institutions emphasize theoretical and practical sessions of physical assessment skills to enhance the competence and confidence of student nurses in physical assessment before the internship.

Keywords: Competence, physical assessment, factors influencing, nurse interns

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1. Introduction

Nursing internship promotes learning, applying knowledge gained in undergraduate training, and the cultivation of basic competencies under the supervision of experienced nurses *(Hu et al., 2022).* This training enables nurse interns to integrate theoretical content with actual experiences in the clinical environment *(Hussien et al., 2021).* The internship aims to expose the nurse interns to direct clinical patient care experience and is part of the employment requirements. During this period, one of the competencies required is the physical assessment of patients with various conditions *(Nursing Council of Kenya (NCK), 2019).*

A shortage of competent nurses and midwives is being experienced globally, and the number is projected to decrease further by 2030 *(World Health Organization, 2016).* This shortage has resulted in the employment of new graduate nurses with less clinical skill competence to curb the shortage. Therefore, student nurses and interns lack adequate and experienced role models in the clinical environment, leading to a deficit in skills performance, including physical assessment, and decreased quality of patient care *(Hussien et al., 2021).*

Physical assessment is essential to the overall health assessment, constituting the nursing process's first phase.

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Accurate physical assessment ensures appropriate diagnostic evaluations and treatments are used during patient management *(Mitoma& Yamauchi, 2018).* While physical assessment competence is considered a major aspect of nursing practice, the competence of nursing interns has been observed as insufficient *(Shin et al., 2017).* Studies show that senior student nurses and nurse interns perform poorly during the physical assessment of patients due to a lack of confidence, inadequate preparedness, and anxiety *(Maniago et al., 2021).* Consequently, this has contributed to poor quality of patient care *(Alamri&Almazan, 2018).*

A significant number of physical assessment skills were under-practiced by the nurse interns who had recently completed their undergraduate training *(Afifi, 2017).* The nurse interns only checked vital signs while important techniques, including auscultation and percussion, were not practiced *(Atakro et al., 2019).* Studies on factors influencing nurse interns' competence in physical assessment have not been documented in Kenya. Therefore, this study sought to fill this gap by investigating the factors influencing nurse interns' competence in physical assessment for adult patients.

2. Significance of the study

Physical assessment competence increases nurse interns' confidence in identifying patients whose health status is likely to deteriorate and plan accordingly, contributing to improved patient outcomes *(Krom, 2020).* Nurses with adequate physical assessment experience can monitor their patient's progress, predict changes in their conditions, and make proper judgments between acute and less acute conditions *(Egilsdottir et al., 2019).* Interns are likely to interpret patient situations accurately, identify the problems, and make probable differential diagnoses, which enables the introduction or recommendation of appropriate diagnostic tests and treatment of patients. This skill further facilitates the recognition of deterioration in a patient's condition, prevents medical errors, and contributes to improved patient outcomes *(Whebell et al., 2021).*

Evaluating factors influencing nurse interns' physical assessment competence provides useful information for nursing services managers, nurse mentors, and nurse training institutions. This information can be useful in developing appropriate strategies that enhance the physical assessment competencies of nurse interns and ensure adequate support as they go through the transition period *(Aboshaiqah et al., 2018).* It also promotes patient assessment approaches that are safe and evidence-based *(Fontenot et al., 2022).* This approach ensures nurse interns' competence and confidence as they enter clinical practice, thus decreasing the chances of medical errors and their possible consequences to patients *(Verghese et al., 2015).*

3. Aim of the study

The study investigated factors influencing nurse interns' competence in physical assessment for adult patients in health facilities in the Western region of Kenya.

4. Subjects & Methods

4.1. Research Design

This study used a cross-sectional analytical research design. Data was obtained from study participants at one point in time. The data collection period was between October 2021 and March 2022. Cross-sectional analytical research design measures the association between exposure and outcome in a specified population. It uses questionnaires or surveys to collect data from research participants *(Schmidt & Brown, 2019).* The research design enabled the researcher to identify and determine the association between physical assessment competence and the factors that influence it.

4.2. Study setting

The study was done in level 5 and 6 referral hospitals in the Western region of Kenya, covering the former Western, Nyanza, and Rift-valley provinces. These comprised Kericho, Nakuru, Kitale, Kakamega, Bungoma, and Kisii County Referral hospitals; Jaramogi Oginga Odinga and Moi Teaching and Referral Hospitals. All the level 5 and 6 hospitals were selected since they act as internship training sites for nurse interns in the Western region of Kenya. The nurse interns are posted to these health facilities for one year after completing Bachelor of Science in Nursing (BScN) training. Each hospital represented a homogenous group (stratum).

4.3. Subjects

The study population comprised BScN graduates undertaking their internship programs in health facilities in the Western region of Kenya. The total number of nurse interns during the period of study was 146.

Inclusion criteria

BScN interns enrolled in the internship program in hospitals in the Western region of Kenya who consented to participate in the study, those who had completed six months of their internship, and those who had completed or were rotating in the adult medical-surgical unit.

Exclusion criteria

Bachelor of Science in Nursing interns who did not consent or were away during the study period.

Sample size was calculated using Cochran's formula *(Cochran, 1977)*, $n= Z^2PQ / e^2$, where n is the desired sample size; Z is the value associated with the level of significance = 1.96 (for 95% Confidence Interval); P is the proportion of the estimated target population (set at 50% since there was no estimate population), thus P = 0.5; Q is 1-P=1-0.5= 0.5; e is the margin error, estimated at 5%=0.05. Thus, the sample size was calculated as $n= (1.96^2x0.5x0.5)/0.05^2 = 384$. Since the population is less than 10,000, the sample size was modified using the formula:

$n = n_0/1+ (n_0 -1/N)$; where n is the desired sample size; n_0 is the sample size when the population is infinite; N is the size of the population. Thus, n= 384/ [1+ {(384-1)/146}]=106

10% was added to the sample size to cater for non-responses and any spoilt questionnaires; 10% of 106 = 11, thus 106+11 = 117. Therefore, 117 nurse interns were selected to participate in this study.

Sampling procedure

The study sample was selected by use of stratified random sampling method. All the hospitals with nurse interns in the Western region of Kenya were used, whereby each hospital represented a homogenous group (stratum). The sample size for the study was first determined, followed by the calculation of the sample size for each stratum based

on the total number of interns enrolled, as shown in Table 1 below. Simple random sampling was then used to select the number of research participants within each stratum. This procedure involved the random selection of research participants whereby each nurse intern had an equal chance to participate in the study.

Table (1): Allocation of nurse interns per health care facility.

Hospital	No. of Interns
Kericho County Referral Hospitals	16
Nakuru County Referral Hospitals	27
Kitale County Referral Hospitals	13
Kakamega County Referral Hospitals	14
Bungoma County Referral Hospitals	13
Kisii Teaching and Referral Hospitals	23
Jaramogi Oginga Odinga Teaching and Referral Hospital	19
Moi Teaching and Referral Hospital	21
Total	**146**

4.4. Tools of data collection

4.4.1 Self-Administered Questionnaire

The study used a self-administered questionnaire to obtain data from nurse interns. It was adopted and modified from *Douglas et al. (2014)* to suit the current research settings to assess the factors influencing the physical assessment competence of nurse interns. It aimed to obtain demographic information on nurse interns and factors influencing their competence in physical assessment.

The questionnaire had two parts. The first part used open-ended questions and consisted of demographic information about nurse interns, including their age, gender, marital status, year of completion of the BScN program, the institution of training, period of internship completed, current placement, and duration of previous clinical experiences.

The second part consisted of identifying personal factors (self-confidence and motivation) that influence the physical assessment competence of nurse interns. This part used a four-point Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree. The tool was written in English and administered only once during the data collection.

4.4.2. Physical Assessment Observation Checklist

The study also used an observation checklist to assess the nurse interns as they performed physical assessments. It was adopted and modified from *Giddens' (2007)* study on physical assessment techniques to assess nurse interns' competence in physical assessment. The aim was to assess core physical assessment skills that nurses use for early identification of any change in the health status of their patients. The checklist comprised two categories: vital signs and body systems (neurological, cardiovascular, respiratory, gastrointestinal, renal, skin, and musculoskeletal systems). The physical assessment skills performed were scored using a three-point scale: 0=cannot perform the technique, 1=can perform the skill but needs to improve further, and 2=can perform the skill well. The overall score was calculated for each nurse intern and then converted into a percentage. The performance level was categorized as poorly performed if the score was <90% and very well performed if the score was ≥90%. The tool was written in English and used only once during the data collection.

4.5. Procedures

Ethical considerations were adhered to before and during the data collection process. Approval was sought from the MMUST School of Graduate Studies, while ethical clearance was sought and provided by the MMUST Institutional Research Ethics Committee (approval no. MMUST/IERC/203/2021). A research permit to conduct the study was sought from and provided by the National Commission for Science, Technology, and Innovation (NACOSTI) (NACOSTI, License no. NACOSTI/P/21/11911). Written permission was sought from all the health facilities included in the research. In order to protect the dignity and integrity of research participants, the researcher applied key ethical principles, including confidentiality, informed consent, justice, beneficence, and respect for human dignity.

The tools were given to a team of research experts from Masinde Muliro University of Science and Technology (MMUST) to ascertain the content and face validity. The experts' opinions were considered, and modifications were made to the tools as necessary. The tools' reliability was verified by using Cronbach's alpha coefficient method to assess the internal consistency. A coefficient value of ≥0.70 was considered an acceptable measure of instrument reliability *(Taber, 2018).* The self-administered questionnaire and observation checklist coefficient values were 0.87 and 0.78, respectively.

A pre-test was conducted to ascertain the validity of the instruments, whether the questions answered what they were intended to measure, and the feasibility of the research process. A default sample size of 30 nurse interns was used during the pre-test to detect any problem with the tools *(Perneger et al., 2015).* Based on the findings from the pre-test, the gaps identified in the questionnaires were adjusted accordingly. However, these results were not used for data analysis of the final study.

Data collection: Research assistants were recruited and trained in the data collection. Informed consent was obtained from the identified BScN interns using unique codes to ensure anonymity and confidentiality. Self-administered questionnaires were then issued to them to fill and return to the research assistants. The procedures involved were explained to the patients, and their verbal consent was obtained. Nurse interns were assessed using an observation checklist as they performed the physical assessment. Data collection was done daily for the participants on day shifts, while those on night duty participated in the morning hours before the completion of their shift.

4.6. Data analysis

Data cleaning was done to ensure completeness, accuracy, and relevance. It was then assigned specific codes for identification and statistical analysis performed using computer software, Statistical Package for Social Sciences (SPSS), version 26. Data was analyzed using descriptive and inferential statistical techniques. All the independent variables that were statistically significantly associated with

the outcome were included in multiple logistic regression. Adjusted odds ratio (AOR) was used to test the strength of association between independent and dependent variables, controlling for confounders. A *p*-value of ≤ 0.05 was used to reject the null hypothesis of no relationship.

5. Results

Table 2 presents the demographic characteristics of research participants. It shows that most nurse interns were 25–29 (57.3%), with an overall mean age of 25.1±1.5 and an age range of 22.0–30.0 years. 53.8% were males and 80.3% were singles. 51.3% completed training in 2020, 57.3% trained in public universities, and 42.7% trained in private or faith-based higher learning institutions. 61.5% had spent 6–8 months during internship compared with 38.5 % who had spent between 9–12 months. 19.7% of nurse interns had a previous clinical experience of more than nine months prior to the internship, while 78.6% had a clinical experience of less than six months.

Figure 1 indicates the competence of nurse interns in performing a physical assessment. The overall competence was determined by obtaining the percentage of respondents with a 90% and above score in physical examination skills. Based on this assessment, 35% (n=41) of nurse interns were competent in physical assessment as they scored 90% and above, while 65% (n=76) were not competent.

Table 3 shows the socio-demographic factors influencing nurse intern competence in physical assessment. Factors that were statistically associated with higher competence scores (≥90%) included year of completion between 2016 – 2019 (OR: 3.1; 95% CI [1.1-8.5]; *p*=0.02), a longer period of internship between 9–12 months (OR: 0.2; 95% CI [0.1-0.5]; *p*=0.0002) and more than seven months previous clinical experience prior to internship (OR: 0.4; 95% CI: [0.2-1.0]; *p*=0.05).

Table 4 shows the personal factors influencing nurse intern competence in conducting physical assessments. Factors statistically associated with higher competence scores (≥ 90%) included self-confidence in performing physical assessments accurately (OR: 4.5; 95% CI [1.9-10.5]; *p*=0.0003) and motivation to learn more and perform physical assessments (OR: 0.4; 95% CI [0.2-1.0]; *p*=0.042).

Table (2): Frequency and percentage distribution of demographic characteristics of study participants (n=117).

Characteristics	No.	%
Age group in years		
20–24	49	41.9
25–29	67	57.3
≥ 30	1	0.8
Mean±SD	25.1±1.5	
Range	22.0–30.0	
Gender		
Male	63	53.8
Female	54	46.2
Marital status		
Single	94	80.3
Married	23	19.7
Year of completion		
2016 – 2018	4	3.4
2019	15	12.8
2020	60	51.3
2021	38	32.5
Type of university		
Public	67	57.3
Private/FBO	50	42.7
Period of internship in months		
6–8	72	61.5
9–12	45	38.5
Current Placement		
Medical	20	17.1
Pediatrics	15	12.8
Theatre	10	8.6
Gynecology	17	14.5
Surgical	12	10.3
Casualty/OPD	21	17.9
Critical care	6	5.1
Community Health Nursing	16	13.7
Duration of previous clinical experience in months		
≤6	92	78.6
7–8	2	1.7
≥9	23	19.7

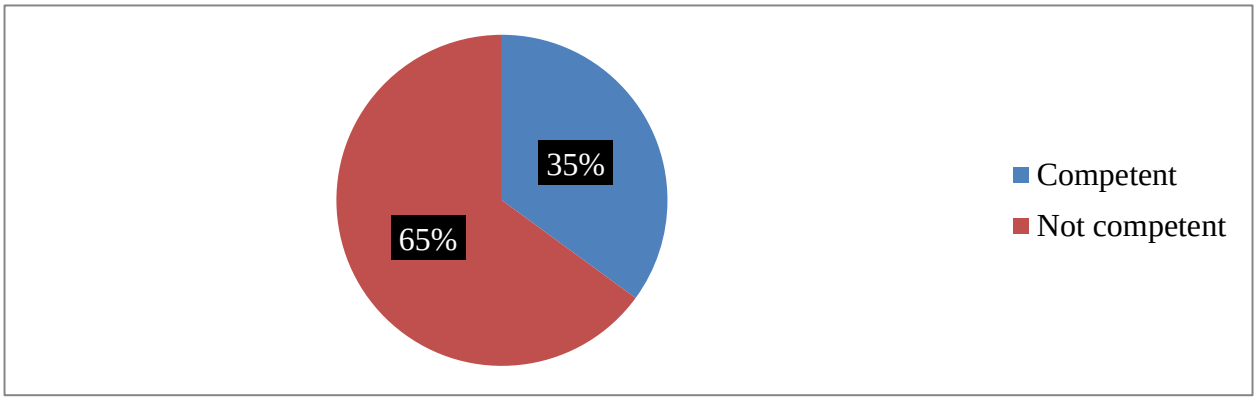

Figure (1): Percentage distribution of nurse intern competence in physical assessment (n=117).

Table (3): Socio-demographic factors influencing nurse intern competence in physical assessment (n=117).

Independent variables	n	Competence score		OR	95% CI	P value
		<90	≥90			
Age group in years						
20–24	49	67.4	32.6	0.8	0.4–1.8	0.64
≥25	68	63.2	36.8			
Gender						
Male	54	63.0	37.0	1.2	0.5–2.5	0.67
Female	63	66.7	33.3			
Marital status						
Single	94	68.1	31.9	0.5	0.2–1.3	0.15
Married	23	52.2	47.8			
Year of completion						
2016–2019	19	42.1	57.9	3.1	1.1–8.5	0.02
2020–2021	98	69.4	30.6			
Type of University						
Public	67	62.7	37.3	1.3	0.6–2.7	0.55
Private/FBO	50	68.0	32.0			
Period of Internship in months						
6–8	72	77.8	22.2	0.2	0.1–0.5	0.0002
9–12	45	44.4	55.6			
Current placement						
Medical, Surgical	47	68.1	31.9	0.8	0.4–1.7	0.56
Others	70	62.9	37.1			
Duration of previous clinical experience prior to internship						
≤6	94	69.2	30.8	0.4	0.2–1.0	0.05
>7	23	47.8	52.0			

Table (4): Personal factors influencing nurse intern competence in physical assessment (n=117).

Independent variables	Categories	n	Competence score		OR	95% CI	P value
			<90	≥90			
Self-confidence							
Confident in performing physical assessments accurately	Agree	62	50.0	50.0	4.5	1.9–0.5	0.0003
	Disagree	55	81.8	18.2			
I am not anxious about my ability to use physical assessment skills correctly	Agree	33	51.5	48.5	2.2	1.0–5.1	0.056
	Disagree	84	70.2	29.8			
Confidence to decide on physical assessment skills to use	Agree	67	61.2	38.8	1.5	0.7–3.2	0.325
	Disagree	50	70.0	30.0			
Motivation							
Adequate encouragement and support from my supervisors	Agree	59	62.7	37.3	1.2	0.6–2.6	0.608
	Disagree	58	67.2	32.8			
I do not feel motivated to learn more and perform a physical assessment	Agree	43	76.7	23.3	0.4	0.2–1.0	0.042
	Disagree	74	58.1	41.9			

6. Discussion

Physical assessment is a key element of the overall health assessment which ensures that appropriate diagnostic evaluations and treatments are used during patient management (*Mitoma & Yamauchi, 2018).* The competence of nursing interns in performing physical assessments has been observed as inadequate *(Shin et al., 2017),* thus leading to poor quality of patient management *(Alamri & Almazan, 2018).* A significant number of physical assessment skills were under-practiced by the nurse interns who only assessed the vital signs, while important physical assessment techniques were not practiced *(Atakro et al., 2019).* This study investigated the factors influencing nurse interns' competence in physical assessment for adult patients in Western Kenya.

The current study shows that more than one third of nurse interns were competent in physical assessment as they scored 90% and above in physical assessment skills. This finding was attributed to a lack of work experience, inadequate orientation, mentorship, effective supervision by clinical instructors, and a lack of effective staff-student relationships in the clinical environment. This finding is supported by *Getie et al. (2021),* whose study on clinical practice competencies revealed that only one-third of graduating student nurses were clinically competent. A study by *Maniago et al. (2021)* on barriers to performing physical assessment also supports this finding, as it showed that student nurses and nurse interns perform poorly during physical assessment due to a lack of confidence, inadequate preparedness, and anxiety.

This study shows that the period spent in an internship was statistically associated with a higher competence score in physical assessment. Those nurse interns who had spent between 6 and 8 months of internship were less likely to perform better than those who had spent 9–12 months. This finding could be attributed to fewer working hours and inadequate clinical learning experience, resulting in lower competence levels in physical assessment. This finding agrees with *Keshk et al. (2018),* whose study on the effectiveness of an educational program in acquiring advanced skills showed an improved level of competence among nurse interns at the end of the internship compared with those who had just begun the program.

The current study shows that a longer period (more than seven months) of clinical experience prior to internship was statistically associated with higher competence scores in physical assessment. This study also shows that those nurse interns who completed undergraduate training earlier (between 2016 and 2019) had higher competence scores in physical assessment compared to those who completed between 2020 and 2021. This finding could be associated with increased exposure to nursing procedures and experienced nurses who provided adequate guidance, thus contributing to increased competence in performing physical assessments. This finding agrees with *Byermoen et al. (2022)*, whose study on the use of physical assessment in clinical rotation indicated that student nurses with prior clinical experiences performed a more focused assessment compared with those without previous experiences who had difficulty determining the relevant skills to use.

From the current research findings, a higher percentage of nurse interns agreed they were confident in performing physical assessments accurately and had higher competence scores. This finding could be attributed to the presence of experienced role models in the clinical environment and the continued practice of various nursing procedures, which enhanced their confidence in performing physical assessments. This finding disagrees with the findings of *Alamri and Almazan (2018)*, whose study on barriers to physical assessment skills showed that student nurses had low confidence levels in performing physical assessments due to fears and anxiety, particularly when handling emergencies. Thus, students and interns could improve their self-confidence, often caused by failure to practice and conduct appropriate physical examinations with adequate support from the preceptors *(Verghese et al., 2015).*

The current research shows that motivation to learn more and perform physical assessment was statistically associated with higher performance in physical assessment. This study shows that most nurse interns agreed they were motivated to perform a physical assessment and had a higher competence score. This finding could be associated with adequate orientation and support from qualified nurses in the clinical environment. This finding agrees with *Egilsdottir et al. (2019)* in their study on revitalizing physical assessment in undergraduate nursing education, as they observed that student nurses who got adequate support and guidance from qualified nurses felt motivated and showed improvement in physical assessment competence. However, the findings disagree with *AlNajjar and Rawas (2018)*, whose study on factors affecting clinical practice indicated unfair handling of nurse interns by nurse managers, preceptors, and physicians, thus decreasing their motivation to perform well and achieve physical assessment competencies.

7. Conclusion

The study findings showed that more than one-third of nurse interns were competent in performing physical assessment skills. Factors that influence physical assessment competence include a year of training completion, the period spent in an internship, previous clinical experience prior to internship, confidence in performing physical assessment accurately, and motivation to learn more and perform physical assessment.

8. Recommendations

The following recommendations are suggested based on the study findings:

The nurse training institution at the universities to put more emphasis on theoretical and practical sessions of physical assessment skills to enhance the competence and confidence of student nurses on physical assessment prior to internship.

The hospitals should provide more opportunities for nurse interns to perform physical assessment skills regularly with adequate supervision. This will improve their motivation and confidence, thus enhancing their competence in physical assessment.

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