

Factors Affecting Skill Acquisition during Clinical Learning Among Preservice Registered Nursing Students at Levy Mwanawasa Medical University in Lusaka, Zambia

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Abstract

Clinical learning is integral to nursing education, essential for the competence development required in a three-year diploma program. This research aimed to investigate factors affecting skill acquisition during clinical learning among preservice Registered Nursing students at Levy Mwanawasa Medical University in Lusaka, Zambia. A cross-sectional descriptive design, employing a self-administered adapted questionnaire pretested for reliability in the UK and Swaziland (Cronbach's alpha: 0.77–0.96, correlation: 0.74) was used. Stratified random sampling based on training level selected 80 participants meeting inclusion criteria through a random sampling method. Data analysis included descriptive statistics, chi-square tests, and binary logistic regression using SPSS version 26, with a 95% confidence interval and 5% significance level. The study identified four predictors significantly correlated with skill acquisition during clinical learning: inadequate supportive learning environment (100%, $n=80$, $p=0.003$), inadequate Student-Patients allocation (83.75%, $p=0.048$), and inadequate Resources (56.25%, $p=0.002$), and inadequate motivation to learn (51.25%, $p=0.037$). Incompetence of clinical instructors and mentors (57.5%, $p=0.233$) and mild Anxiety (85%, $p=0.762$). Binary Logistic Regression, adjusted for independent variables, indicated that an improved supportive learning environment decreased skill acquisition odds (Odds Ratio=0.049, $p=0.025$), while increased resource availability raised odds (Odds Ratio=3.338, $p=0.01$) for students who perceived these variables as inadequate. The omnibus test was significant (chi-square=14.095, $p=0.015$), accurately classifying 72.5% of cases. Collaboration among educators, clinical staff, and policymakers is crucial for enhancing nursing education quality by addressing factors affecting clinical skills acquisition.

Keywords: Anxiety, clinical learning, competence of clinical instructors and mentors, resources, skill acquisition, supportive learning environment.

Introduction

Clinical experience has been always an integral part of nursing education. Clinical practice stimulates students to use their critical thinking skills for problem solving, though learning experiences for nursing students may be painful. Clinical learning is an indispensable part of nursing education programme and an integration of theoretical and practical learning experiences which plays an important role in the

acquisition of professional abilities [1]. Clinical learning is the means by which nursing students learn to apply the theory of nursing, facilitating integration of theoretical knowledge and practical skills in the clinical setting which becomes the art and science of nursing. It is the basis on the development of professional nursing. It prepares student nurses to be able to do as well as to know the clinical principles in practice [2] Acquisition of clinical skills has

been shown to improve the quality of care provided to patients when care providers are competent [3]. Acquisition of clinical skills is achieved through clinical learning. Equipping nursing students with clinical skills and knowledge corresponds with the demands of the nurse's role as the primary goal of nursing education [2]. Benner's "novice to expert" theory, rooted in the Dreyfus model of skill acquisition, guides clinical teaching in nursing by delineating five levels of skill development. This progression involves a shift from abstract principles to the integration of concrete experiences, with a unique emphasis on the relational aspect of nursing care, distinguishing it from other psychomotor skill models [4]. Learning takes place when students apply what they have learnt in the classroom situation and practiced in the skills laboratory into the reality of nursing [5]. Social learning interactions support students in gaining a deeper comprehension and acquiring new insights, with the use of different learning styles promoting skill acquisition [6]. The assessment of nursing students based on their level of training and Benner's Model stages within the framework of Social Constructivism helps identify factors affecting skill acquisition in clinical practice [2]. In this study, skill acquisition refers to the process of developing the necessary competencies to become a Registered Nurse, measured by the effectiveness of clinical placements. Despite the Nursing and Midwifery Council of Zambia (NMCZ) implementing an enhanced curriculum to improve learning and facilitate the integration of theory into practice, aiming to foster the acquisition of cognitive, psychomotor, and affective skills among nursing students, it has been noted that there persists a challenge of subpar performance in clinical skills [7]. This is evident in numerous nursing schools, and graduates from nursing colleges often lack the essential competence needed to deliver high-quality care to patients in the majority of hospitals. Shortages in clinical staff also contribute to irregular supervision and

mentoring of registered nursing students in Sub-Saharan Africa, impeding effective competence development [8, 9]. The existing information on factors influencing skill acquisition among preservice Registered Nursing students lacks specificity, scope, context-specific relevance, and may be outdated. Recognizing these limitations and the need for more detailed investigation, the study aimed to address these gaps by specifically focusing on students from Levy Mwanawasa Medical University in Lusaka (LMMU), Zambia. With a background as a nurse educator, the researcher sought to investigate and explain the factors affecting skill acquisition during clinical learning, aimed at improving student performance and elevate the standard of patient care by enhancing clinical education.

Specifically, the study sought to determine the level of skill acquisition during clinical learning and to identify factors that affect skill acquisition during clinical learning among preservice Registered Nursing students.

Justification of the Study

There was need to conduct this research to investigate and explain the factors affecting skill acquisition during clinical learning among preservice registered nursing students from LMMU, in Lusaka, Zambia. The outcomes of the research will also be advantageous for other institutions, policymakers, and regulatory bodies engaged in the education of nurses, contributing to the enhancement of quality clinical training.

Materials and Methods

Study Design and Area

This research utilised a quantitative, cross-sectional descriptive design. The study was conducted at LMMU. LMMU is a public university and first ever specialized University for health studies in Lusaka, Zambia. The main campus of the university is in Chainama Hill, in northeastern Lusaka. The LMMU School of Nursing is one of the schools at LMMU and is recognized nationally and internationally for excellence in educating and training healthcare

workers for Zambia and the Southern Africa region. Amongst the programs offered by LMMU, School of Nursing is preservice registered nursing. The choice of the study area was determined by interest in relation to research problems, familiarity of the locality where the researcher is working, making data collection less cumbersome, simplifying the process of data collection. Beyond convenience, this choice enhanced access to participants, provided logistical ease, contributed to cultural understanding, addressed ethical considerations, improved data quality and leveraged existing resources.

Study Population

The study population included all the one hundred (100) second year nursing students enrolled in the preservice diploma in registered nursing program at LMMU, School of Nursing.

Sampling Method

The study population was divided into subgroups or strata according to year of study. Using a method of stratified random sampling determined by training level, 80 participants meeting the inclusion criteria were randomly selected.

Sample Size

Sample size is the number of participants in a sample [10]. The sample size was calculated manually using formula [11] for determining small sample size. The total population for second year of training nursing students pursuing a preservice diploma in registered nursing in the regular approach was 100.

$$\text{Sample Size } (S) = \frac{X^2NP(1 - P)}{d^2(N - 1) + X^2P(1 - P)}$$

S = the required sample size

N = Population size

X = Z value (e.g. 1.96 for 95% confident level)

P = Population proportion (expressed as decimal) (assumed to be 0.5(50%))

d= Degree of accuracy (5%) expressed as a proportion (0.05); it is the margin of error

$$\begin{aligned} \text{Sample Size } (S) &= \frac{X^2NP(1 - P)}{d^2(N - 1) + X^2P(1 - P)} \\ &= \frac{1.96^2(100)0.5(1 - 0.5)}{0.05^2(100 - 1) + 1.96^2(0.5)(1 - 0.5)} \\ &= \frac{96.04}{1.2079} = 79.51. \end{aligned}$$

Therefore S = 80 participants

Inclusion Criteria

The study included participants who met specific inclusion criteria: Nursing students aged 18 years and above, with over one year of training, having undergone at least one clinical allocation lasting a minimum of ten (10) weeks at the time of the study. This ensured participant maturity, foundational knowledge, and substantial exposure to clinical practice, enhancing the study's quality and relevance by including individuals with the necessary attributes and experiences related to clinical skills and competence and Second-year nursing students who were available and willing to participate in the study.

Exclusion Criteria

Those who did not meet the inclusion criteria set by the researcher were excluded from the study, that is, nursing students who did not give consent.

Data Collection Tool

A self-administered adapted structured questionnaire as the data collection tool, from the clinical learning environment and teaching scale (CLES-Scale) by Mikko Saarikoski's. The tool was validated and tested for its reliability, validity, and sensitivity to change. The tool had the Cronbach's alpha ranging from 0.77 to 0.96 and correlation coefficient at 0.74, respectively [12, 13].

Pilot Study

Prior to the main study, the effectiveness of the data collection tool was evaluated through a pilot study/pre-test, which involved second-year

nursing students. A sample size equivalent to 10% of the calculated total, amounting to eight (8) respondents, was utilised. This process assisted the researcher in identifying any components that required modification. Following the pre-test, necessary adjustments were made to the self-administered questionnaire by the researcher before the commencement of the actual study.

Data Collection Technique

Data collection method used was in-person survey. Survey research means collecting information about a group of people by asking them questions and analysing results [14]. The questionnaires were distributed to each nursing student at a time when they were on school campus during class session breaks for participants' privacy.

Data Analysis

Data analysis involved descriptive statistics, chi-square test as well as the Fisher's exact test for values that are less than 5, testing for associations, and binary logistic regression using SPSS version 26, Confidence interval was set at 95% and 5% level of significance.

Ethical and Cultural Considerations

Ethical approval and clearance were sought from University of Zambia Biomedical Research

Ethics Committee (UNZABREC) Reference Number: 3529 – 2022 (Appendix VI), National Health Research Authority (NHRA) Approval Ref No: NHRA0022/11/05/2023 (Appendix VII). NHRA Registration Number: NHAR-R-1423/28/11/2022 A written permission was sought from the Dean of LMMU School of Nursing and from the Principal of School of Nursing at Sanridge Institute of Health and Social Sciences for study and pilot study respectively.

In obtaining written consent, participants were informed about the study's purpose, nonmaleficence was maintained through the absence of harm-inducing procedures and protection from psychological distress during questioning. The principle of justice was observed by equal treatment and random selection, while beneficence was upheld by the potential contribution of research outcomes to knowledge without imposing adverse consequences on participants who could freely withdraw.

Results

Clinical Skill Acquisition characteristics were adjusted based on test assumptions outlined by [2], and classifications were assigned according to statistical outcomes and variable cut-off points using SPSS version 26

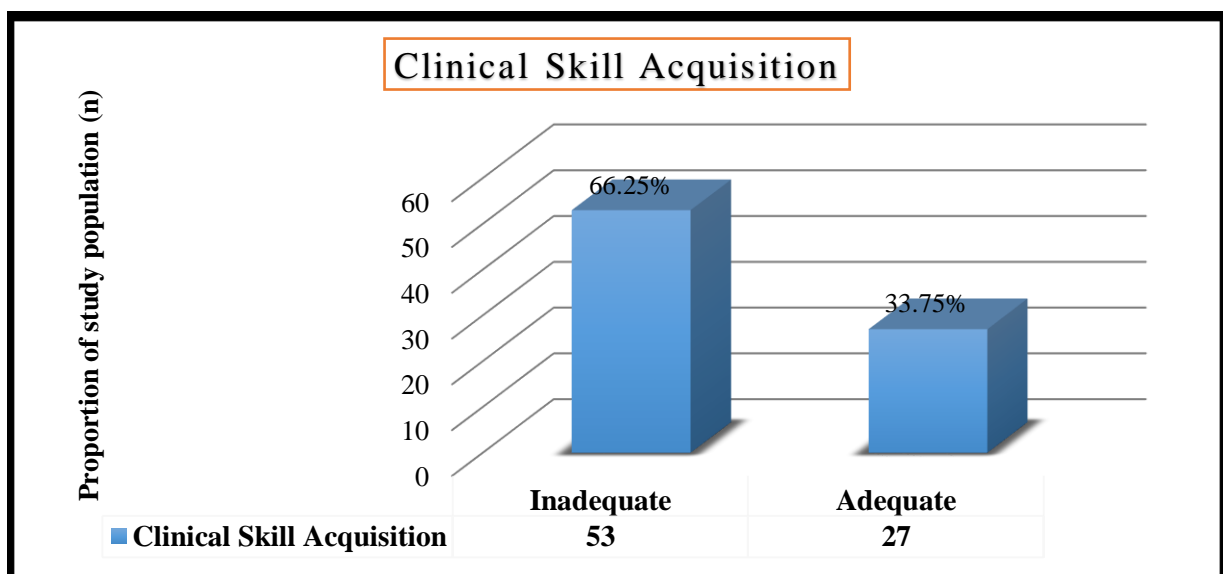


Figure 1. Summary of Clinical Skill Acquisition (n=80)

Figure 1 shows that out of the 80 respondents, (66.25%, n=53) reported inadequate clinical skill acquisition while (33.75%, n=27) reported adequate clinical skill acquisition.

Table 1 summarizes the relationship between Skill Acquisition and Environmental Factors.

Table 1. Relationship between Skill Acquisition and Environmental Factors (n=80)

Independent Variable	Skill Acquisition		Total	p- value
	Inadequate	Adequate		
Environmental Factors				
1. Support Structure				
Supportive learning environment				
Inadequate	53 (66.25%)	27 (33.75%)	80 (100%)	0.003
Adequate	0 (0%)	0 (0%)	0 (0%)	
Very Adequate	0 (0%)	0 (0%)	0 (0%)	
Total	53 (66.25%)	27 (33.75%)	80 (100%)	
Competence of clinical instructors and mentors				
Inadequate	34 (73.9%)	12 (26.1%)	46 (100%)	0.233
Adequate	17 (56.7%)	13 (43.3%)	30 (100%)	
Very Adequate	2 (50%)	2 (50%)	4 (100%)	0.121 ^{FE}
Total	53 (66.25%)	27 (33.75%)	-	-
2. Management of Resources				
Student-Patients allocation:				
Inadequate	48 (71.6%)	19 (28.4%)	67 (100%)	0.048
Adequate	5 (41.7%)	7 (58.3%)	12 (100%)	
Very Adequate	0 (0%)	1 (100%)	1 (100%)	0.025 ^{FE}
Total	53 (66.25%)	27 (33.75%)	-	-
3. Availability of Resources				
Inadequate	37 (82.2%)	8 (17.8%)	45 (100%)	0.002
Adequate	14 (48.3%)	15 (51.7%)	29 (100%)	
Very Adequate	2 (33.3%)	4 (66.7%)	6 (100%)	0.004 ^{FE}
Total	53 (66.25%)	27 (33.75%)	-	-

FE= Fisher's exact test

Support Structure: Supportive Learning Environment: The findings show an association between skill acquisition and supportive learning environment which is statistically significant with the P-value of 0.003.

Competence of Clinical Instructors and Mentors: The findings show no association between skill acquisition and competence of clinical instructors and mentors which is statistically insignificant with the P-value of 0.233. The chi-square value was 2.913; p-value for the Pearson test was 0.233 and 0.121^{FE}. The degrees of freedom (df) were 2. (Chi-square

value=2.913, df=2 and p-value=0.233). We do not reject the null hypothesis of no significant association between the variables being tested.

Management of Resources: Student-Patients Allocation: The findings show an association between skill acquisition and student-patient allocation which is statistically significant with the P-value of 0.048 and 0.025^{FE}. The Pearson chi-square value is 6.078 with 2 degrees of freedom. (Chi-square value=6.078, df=2 and p-value=0.048). We reject the null hypothesis of no significant association between the variables being tested

and conclude that there is a significant association.

Availability of Resources: The findings show an association between skill acquisition and availability of resources, which is statistically significant with the P-value of 0.002. The chi-square was 12.232. The p-value for the Pearson test was 0.002 and 0.004^{FE}. The degrees

of freedom (df) were 2. (Chi-square value=12.232, df=2 and p-value=0.002). We reject the null hypothesis of no significant association between the variables being tested, and conclude that there is a significant association.

Table 2 summaries the Relationship between Skill Acquisition and Student Related Factors.

Table 2. Relationship between Skill Acquisition and Student Related Factors

Independent Variable	Skill Acquisition		Total	p- value
	Inadequate	Adequate		
Student Related Factors:				
Motivation to learn:				
Inadequate	28 (77.8%)	8 (22.2%)	36 (100%)	0.032
Adequate	22 (53.7%)	19 (46.3%)	41 (100%)	
Very Adequate	3 (100%)	0 (0%)	3 (100%)	0.040 ^{FE}
Total	53 (66.25%)	27 (33.75%)	-	-
Anxiety:				
Mild	45 (66.2%)	23 (33.8%)	68 (100%)	0.762
Moderate	7 (63.6%)	4 (36.4%)	11 (100%)	
Severe	1 (100%)	0 (0%)	1 (100%)	1.000 ^{FE}
Total	53 (66.25%)	27 (33.75%)	-	-

FE= Fisher's exact test

Motivation to Learn: The findings indicate that motivation to learn may have an influence on skill acquisition, with higher levels of motivation potentially associated with better skill acquisition outcomes which is statistically significant with the P-value of 0.032. The chi-square test is 6.575 and the degrees of freedom (df) are 2. (Chi-square value=6.575, df=2 and p-value=0.032). The p-value is 0.032, and 0.040^{FE} indicating that there is evidence to reject the null hypothesis of no association between the two variables.

Anxiety: The Pearson Chi-Square test statistic is 0.543, 2 degrees of freedom. (Chi-square value=0.543, df=2 and p-value=0.762). The asymptotic p-value is relatively high at 0.762 and 1.000^{FE} which suggests that there is not strong evidence to reject the null hypothesis of independence.

Binary Logistic Regression Analysis adjusted for Environmental and student factors affecting Skill Acquisition during Clinical Learning

Binary logistic regression analysis showed that odds of predictor variables, supportive learning environment were 0.049 times towards skill acquisition. The p-value was 0.025, which suggested that the baseline odds of skill acquisition are significantly lower than the odds when other predictor variables are present and is also statistically significant relationship with skill acquisition. Competence of clinical instructors and mentors is associated with 1.068 times increase in the odds of skill acquisition. However, the high p-value of 0.9 suggests that this relationship is not statistically significant; Student-Patients allocation is associated with 2.182 times increase in the odds of skill acquisition. However, the p-value of 0.301

suggests that this relationship is not statistically significant. Availability of Resources is associated with 3.338 times increase in the odds of skill acquisition. The low p-value of 0.01 suggests that this relationship is statistically significant. Motivation to learn odds ratio is 1.019. However, the p-value is 0.968, indicating that it is not statistically significant. This suggests that there is no substantial impact of motivation to learn on the odds of skill acquisition and Anxiety odds ratio is 0.587. Although the odds ratio is less than 1, indicating a negative association between anxiety and skill acquisition, the p-value of 0.453 suggests that this relationship is not statistically significant.

Therefore, the results do not provide strong evidence for the impact of anxiety on the odds of skill acquisition.

The regression model was statistically significant ($X^2 = 14.095$, $p = 0.015$) indicating that the independent variables as a set are significantly related to the dependent variable. The final model correctly classified 72.5% of cases, with 58 cases. In the model or equation, changes in Availability of Resources from inadequate to adequate to very adequate impacted significantly on the model, with p-value of 0.01 and supportive learning environment which was inadequate, and p-values of 0.025.

Table 3. Binary Logistic Regression of Factors Affecting Skill Acquisition (n=80)

Variables		B	Sig.	EXP (B)	95% C.I. for EXP(B)	
					Lower	Upper
Supportive Learning Environment	Ref: Inadequate Adequate	3.009	0.025	0.049	-	-
Competence of clinical instructors and mentors	Ref: Inadequate Adequate	0.066	0.9	1.068	0.384	2.975
Student-Patients allocation	Ref: Inadequate Adequate	0.78	0.301	2.182	0.498	9.567
Availability of Resources	Ref: Inadequate Adequate	1.205	0.01	3.338	1.337	8.334
Motivation to learn	Ref: Inadequate Adequate	0.019	0.968	1.019	0.398	2.61
Anxiety	Ref: Severe Mild	0.534	0.453	0.587	0.146	2.363

B or **cOR** = Crude Odds Ratio, EXP(B) or **aOR** = Adjusted Odds Ratio, **CI** = Confidence interval

Discussion of Findings

Socio-Demographic Factors of The Study Population

Most of the participants were aged between 18 - 30 years and the mean age was 22.05 years. This was attributed to the fact that most of the participants were enrolled in training after the 18th birthday or later. In Zambia, the average age of people beginning tertiary education is 18-24 years [15].

There were 80 pre-service Registered Nursing students included in the study. Of these students,

83.8% were female and 16.3% were male. Nursing being a female dominated profession [16]. The age of the students ranged from 18 to 30 years, with a mean age of 22.05 years, a median age of 21 years, and a mode of 21 years.

The standard deviation of the age variable was 2.728 and the variance was 7.441. This suggests that the age of the students was relatively tightly clustered around the mean. All the pre-service students included in the study were in their second year of training.

Discussion on Each Variable

Skill Acquisition

In this study, Clinical skills acquisition refers to the process of acquiring and developing nursing skills and competencies necessary to become a Registered Nurse, as measured by the effectiveness of clinical placements. A significant proportion of respondents, 53.8%, were either not sure or did not feel that the duration of their placements was adequate. This suggests a need for improvement in the duration of placements to ensure that trainees have adequate time to acquire the necessary skills. This is in line with a study by [17] who explained that the curriculum emphasizes the importance of both classroom and clinical learning in the acquisition of nursing competencies. The course outline is structured to reflect a progression of difficulty from basic to advanced levels, ensuring that students develop a thorough understanding of the required knowledge and skills. More than three quarters agreed or strongly agreed that the objectives and guidelines of their training were clear. However, a small portion disagreed or strongly disagreed or were unsure, indicating that there is still room for improvement in communicating objectives and guidelines to trainees. This is like a study by [18] which found that providing students with a copy of the clinical objectives for their assigned clinical placement helps enhance their understanding of the tasks to be performed.

A significant proportion of respondents, 68.8%, either disagreed or strongly disagreed or were unsure that the theory taught was in line with practice which suggests that there may be a gap between theory and practical application. This is in line with the study conducted in Malawi by [5] who identified a significant challenge for nursing students in the gap between theory and practice. Many students reported dissatisfaction with the integration of theoretical knowledge into clinical practice. Despite having a lot of theoretical knowledge, they lacked opportunities to apply it in practice.

A study in Iran by [19], alluded to the fact that the clinical environment is complex and rapidly changing, with a variety of new settings and roles in which nurses must be prepared to apply the knowledge they have learnt, this thus, demands a new approach to teaching and learning. This is contrary to the current study which revealed that only 43.8% agreed or strongly agreed that patients are managed upholding ethical principles according to what is taught in class. This suggests that there is a significant gap between the ethical principles taught in the classroom and what is applied in practice, which have implications for patient outcomes. Most respondents, 70%, agreed or strongly agreed that practical assessments were given for specific procedures, suggesting that practical assessments are generally seen as an effective way to evaluate trainee performance. Similar observations were made in studies conducted in Canada by [20], who suggested that academic and clinical educators should provide clinical nurses with an outline of student competencies and learning needs at the beginning of each clinical rotation. A majority of the respondents perceived their clinical skill acquisition as inadequate. It appears that there may be areas for improvement in the duration of placements, communication of objectives and guidelines, and the alignment between theory and practice. It may be beneficial for those responsible for clinical training to review these results and consider potential interventions or changes to address these issues. This agrees with a study by [20], who concluded that developing clinical skills is essential in forming the professional identity of nursing students and ensuring they are ready to meet the challenges of the nursing field.

Summary of Environmental Factors Affecting Skill Acquisition

Based on respondents' perception, the supportive learning environment was inadequate (100%, n=80), Competence of clinical instructors and mentors was inadequate (57.5%,

n=46), Student-Patients allocation was inadequate (83.75%, n=67), Resources were inadequate (56.25%, n=45). These results are corresponding to a study by Mwale and Kalawa (2016) who suggested that effective clinical supervision, appropriate patient assignments to students can provide students with feedback and support that can enhance their confidence and competence in clinical practice. Appropriate patient assignments can help students feel more comfortable and capable of providing care, while case presentations can provide opportunities for students to learn from their peers and reflect on their experiences.

Summary of Student Factors Affecting Skill Acquisition

The distribution of responses for the two student-related factors were inadequate motivation to learn or lack of motivation to learn (51.25%, n=41) and mild anxiety (85%, n=68). Similarly, in a study by [21], they suggested that stress and anxiety are not only workplace problems, but they can also hinder students' learning due to various stressors. Many students reported anxiety as one of the factors that impact their performance in clinical practice as well as lack of motivation. This anxiety is rooted in the students' empathy for their patients.

Relationship Among Dependent and Independent Variables

Relationship Between Skill Acquisition and Environmental Factors

Supportive Learning Environment: It indicates that individuals with an inadequate support structure are more likely to have inadequate skill acquisition compared to those with an adequate support structure. This is in line with a study by [4] who concluded that learning in the clinical environment provides the real-world context for nursing students to develop the knowledge, skills, attitudes and values of a registered nurse.

Initially all nursing students are considered novices upon commencing the nursing training

because they do not have or have very minimal previous knowledge on clinical practice and progress to advanced beginner, competent, proficient and expert.

Competence Of Clinical Instructors and Mentors: It indicates that individuals who reported incompetence among their instructors and mentors were more likely to express inadequate skill acquisition. On the other hand, those who reported adequate or very adequate competence had a higher likelihood of expressing adequate skill acquisition. The chi-square test results suggest some association, but the p-value of 0.233 indicates that the association is not statistically significant.

Management of Resources: Student-Patients Allocation: The findings suggests that inadequate management of student-patient allocation results in inadequate skill acquisition. It also indicates that some respondents reported adequate management but still expressed inadequate skill acquisition. We reject the null hypothesis of no significant association between the variables being tested and conclude that there is a significant association. This study was in line with [7] who noted that the learning process of nursing students was negatively affected due to the overcrowding of wards.

Availability of Resources: The findings suggested that environmental factors such as support structure, competence of clinical instructors and mentors, student-patients allocation and availability of resources play a role in skill acquisition. Addressing and improving these factors may contribute to better skill acquisition outcomes among the respondents.

These results are corresponding to [7] study, which found that nursing students' clinical learning and skill acquisition are adversely affected by various factors, including staff shortages, unavailability of ward managers for consultations, and unaccompanied as well as clinical supervisors being difficult to access.

Relationship Between Skill Acquisition and Student Related Factors

The findings indicated that Motivation to learn may have an influence on skill acquisition, with higher levels of motivation potentially associated with better skill acquisition outcomes which is statistically significant with the P-value of 0.037, indicating that there is evidence to reject the null hypothesis of no association between the two variables. Similarly, [22] concluded that lack of initiative by students in their own learning of skills is a hindrance in its own.

Anxiety: Respondents also experienced varying levels of anxiety, with a significant proportion (66.2%, n=45) who reported mild anxiety expressed inadequate skill acquisition. While the relationship between anxiety and skill acquisition which is statistically insignificant with the P-value of 0.762, may not be as pronounced as with motivation to learn, it is worth considering the potential impact of anxiety on skill acquisition outcomes. The asymptotic p-value is relatively high at 0.762 which suggests that there is not strong evidence to reject the null hypothesis of independence. In related research, [23] discovered an indeterminate amount of stress and anxiety that hindered nursing students' comfort and ability to acquire new skills during clinical practice. Although the word is the ideal place to learn, very few learners' needs are met in this environment [1].

Binary Logistic Regression Determining the Relationship Between Skill Acquisition and Environmental and Student Factors

Binary logistic regression analysis showed odds of predictor variables. The odds of predictor variable supportive learning environment were 0.049 times towards skill acquisition. The p-value was 0.025, which suggested that the baseline odds of skill acquisition are significantly lower than the odds when other predictor variables are present and is

also statistically significant relationship with skill acquisition. A one-unit increase in Availability of Resources is associated with 3.338 times increase in the odds of skill acquisition. The low p-value of 0.01 suggests that this relationship is statistically significant.

The associations between the variables and the outcome can change when accounting for other factors (multivariable analysis). Some variables, like Availability of Resources, became more statistically significant and have a stronger impact on the outcome when other variables are considered. Others, like Competence of Clinical Instructors and Mentors and Motivation to Learn, do not show significant associations in either univariate or multivariable analyses. The significance level (p-value) helps determine the statistical significance of these associations. These findings suggested that it is important for educators and trainers to consider the different factors that may influence skill acquisition in learners, including their supportive learning environment and availability of resources.

This is like [24], who concluded that having a high number of students in one placement area during clinical training leads to a reduction in the learning opportunities available for student nurses. Creating a more supportive and collaborative environment may lead to improved learning outcomes for students and a more positive experience during their clinical placements.

This is also in line with a study conducted by [25] in Cameroon, a major challenge facing student nurses during their practical training is a lack of equipment and at times not working, which makes it difficult for them to acquire the necessary skills.

Overall Significance of The Regression Model

The omnibus tests of model coefficients showed that the model is significant ($p = 0.015$), indicating that at least one of the independent variables is significantly associated with the

dependent variable and that this model outperforms the null model. The classification table shows that the model correctly classified 72.5% of cases. The independent variables included in the model are: Supportive learning environment, Competence of clinical instructors and mentors, Student-Patients allocation, Availability of Resources and Anxiety.

Conclusion

The study revealed that an unsupportive learning environment, inadequate student-patient allocation, resource shortages, and low motivation significantly hindered skill acquisition in clinical learning. However, perceived incompetence of instructors and mentors, as well as mild anxiety, showed no significant impact. Addressing these issues can enhance overall skill development during clinical learning.

Recommendations

1. Nursing educators should consider collaborating with healthcare institutions to ensure that clinical placements provide a conducive environment for learning and practice, with adequate supervision and resources.
2. The nursing school management should invest in adequate resources, both human and material, to ensure a conducive learning environment for the nursing students. This includes having sufficient staffing levels, clinical supplies and equipment, and a comfortable and safe clinical setting.
3. The Ministry of Health should continue expanding the training and employment of registered nurses.
4. The Nursing and Midwifery Council of Zambia should continue to encourage and support nursing and midwifery research especially in skill acquisition during clinical learning to identify best practices, address gaps in knowledge, and improve patient outcomes.

This study was limited to the factors affecting skill acquisition during clinical learning among preservice Registered Nursing students at a particular university nursing school in Zambia, from the nursing students' perspective; therefore, it is recommended that future studies be extended to other nursing training institutions so that a broader understanding of the factors affecting skill acquisition during clinical learning and generalization of the findings could be done. Furthermore, there would be need to conduct a study on clinical skill acquisition to have basic understanding whether the nursing students acquired skill or not.

Declaration of Interest

The authors hereby declare that this article represents our own work. We further declare that all the sources we have cited have been indicated and acknowledged using complete references.

Author's Contributions

RT was responsible for the study conception and design, data collection and analysis and drafting the manuscript. MKM and NN supervised the research process and made critical revisions to the article.

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