

# An Experimental Study on the Effectiveness of Competency-Based Assessment Based on Benner's Novice to Expert Theory in Enhancing Knowledge and Clinical Skills of Staff Nurses in Basic and Advanced Nursing Procedures

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## Abstract

**Aim/Objective:** The study aims to evaluate the effectiveness of competency-based assessment, grounded in Benner's Novice-to-Expert Theory, in enhancing the knowledge, clinical skills, and overall competency of staff nurses in basic and advanced nursing procedures.

**Methods:** This Experimental study utilizes a Sequential Explanatory Mixed-Methods design, and 150 staff nurses from Medanta Lucknow, a private tertiary health care centre, are included. Structured questionnaires to measure the level of knowledge, clinical skills, and competency are used to collect quantitative data prior to and following a 4-week competency-based intervention. The intervention combines stage-specific training, a structured demonstration of skills, reflective feedback and case-based simulation to Benner's learning framework. Semi-structured interviews are conducted with 20 purposively selected nurses to gain their experiential knowledge. Analysis of the quantitative data is done through descriptive statistics, paired t-test and analysis of qualitative data is done through thematic analysis using NVivo software.

**Findings:** There is a statistically significant increase in knowledge, clinical skill, and competency scores after the intervention ( $p \leq 0.002$  for all). The qualitative results show four themes: skill and confidence development, dealing with complex care, support and guidance, and implementation challenges. Repeated exposure, structured mentorship, and feedback improve nurses' decision-making, practical skills, and professional confidence.

**Conclusion:** Competency-based assessment effectively improves knowledge acquisition and supports professional growth, validating Benner's staged model of skill development and emphasizing structured mentorship for clinical proficiency.

**Keywords:** *Competency-Based Assessment, Benner's Novice-to-Expert Theory, Staff Nurses, Clinical Skills, Knowledge Enhancement, Mentorship.*

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## Introduction

The modern healthcare system demands nurses who have acquired skills in their profession because of the complexity of the system, the rapidity of modern technology, and the demand for excellent healthcare services that are based on patients' needs (Baumann et al., 2025). The modern hospital operates in changing systems that demand quick decisions from its staff, which should be implemented in uncertain situations (Rothwell et al., 2021). The success of healthcare delivery is dependent on three factors, which include skills, the ability of nurses to collaborate with other professionals, and leadership skills, as these factors determine the results of patients and the performance of the hospital. However, Clinical supervision, decision-making, and skill transfer continue to hinder effective performance in practical environments, notwithstanding formal educational training (McLaney et al., 2022). The evidence-based practice movement that hospitals are now focusing on requires nurses who have both theoretical and

practical knowledge to address this need (Ominyi et al., 2025).

The nursing education system consistently encounters the difficulty of nursing students' inability to connect theoretical knowledge with practical application. The nurses are encountering difficulties in connecting and implementing the fundamental nursing information acquired in their education to intricate clinical practice. The traditional assessment system of checking checklists only evaluates the completion of tasks, leading to ineffective evaluation of clinical reasoning, judgment, and experiential learning (Bratianu et al., 2020). This requires educational systems around the world to implement competency-based education. This is because this system requires students to display their competency and ability to think critically and perform tasks (Cate & Taylor, 2020). The nursing profession in today's world requires practitioners who are able to demonstrate financial, administrative, and leadership abilities, which are now part of the competency system to assess

performance (Bayram et al., 2022; Pérez-González et al., 2024). The competency-based education method that has been developed is effective and acts as an educational tool that supports international professional development practices that require staff nurses to develop skills through real-world learning (Tsiligiris & Bowyer, 2021).

Novice to Expert Theory, as propounded by Patricia Benner, provides a firm foundation for understanding the development and growth of nurses in terms of clinical ability. This theory is based on the fact that professional growth is achieved through five different stages, namely "novice, advanced beginner, competent, proficient, and expert." This theory helps in understanding the growth and development of professionals in terms of clinical assessment skills (Elhami et al., 2018). According to this theory, developing clinical ability requires experience and understanding, not just time. Nurses improve their skill sets by moving from rule-based decision-making to intuitive and complete decision-making as they progress through these stages. The studies show that the developmental process improves the effectiveness of the nurses' clinical competence, self-efficacy, and decision-making skills (Ritchie et al., 2021). The theory has identified situational awareness and experiential knowledge as essential factors that affect the effectiveness of clinical judgments in complex healthcare settings.

Competency-based assessment systems that have been developed following Novice to Expert Theory are strongly supported at the theoretical level. However, there is limited robust experimental evidence to fully validate their effectiveness in clinical settings. The conducted studies have descriptive methodologies, limiting their potential. The study of professional development often incorporates both quantitative and qualitative methodologies to provide a comprehensive understanding of the process. The development of nurse competency at different stages needs to be studied since it contains significant knowledge about their educational history. The assessment of Benner-based assessment tools involves mixed study methodologies in order to assess their effectiveness in developing clinical competencies.

Apart from the introduction, "the rest of the paper is structured as follows: section 2 describes reviews of different authors from past studies related to Effectiveness of Competency-Based Assessment Based on Benner's Novice to Expert Theory in Enhancing Knowledge and Clinical Skills of Staff Nurses," section 3 presents the study objectives, the research methods used in the study are summarized in section 4, section 5 presents the study results with its corresponding findings, section 6 presents the discussion section, and Section 7 shows the conclusions, implications, limitations, and

recommendations for Further Studies. Finally, references are presented.

## **1. Review of Literature**

### **1.1 Theoretical Framework**

#### **➤ Benner's Novice to Expert Theory**

Patricia Benner developed "Novice to Expert Theory in 1984, where she applied the Dreyfus Model of Skill Acquisition to demonstrate how nurses develop clinical competence based on their experience." The theory describes five progressive stages of expertise that include novice, advanced beginner, competent, proficient, and expert (Benner, 1984). The novice individual requires the use of rules and guidelines, whereas the advanced beginner and competent individuals start to identify patterns that help them establish the significance of the task based on previous knowledge. Competent nurses generally pursue long-term objectives and deliberate planning, whereas advanced beginners remain mostly dependent on situational elements and require guidance to prioritize tasks. The expert and proficient stages of nursing help nurses have a number of clinical decision-making options that are flexible and intuitive in nature (McHugh & Lake, 2010). An integral part of this theory is that skill development is achieved through constant exposure to real clinical situations that help learners develop their clinical judgment skills as decisions are made in line with specific situations. The system demonstrates that competence involves a blend of practical skills and knowledge about specific situations. Benner's framework provides a system for competency assessment that helps in assessing nurse skill development as it tracks their clinical expertise and decision-making progress in various hospitals.

### **1.2 Role of Competency-Based Assessment in Enhancing Nursing Knowledge and Clinical Competence**

Nursing education that utilizes competency-based assessment strategies has been shown to help staff nurses acquire both knowledge and skills, but there are differences in how nursing education and practice implement and assess competency-based education strategies. A study by Nagai et al. (2024) showed that nurses who underwent competency-based education had better competencies in professional communication, clinical decision-making, and professional growth compared to nurses who underwent objective-based education. However, there are still gaps in clinical skills. Similarly, Arrogante et al. (2021) showed that through the assessment that used both formative and summative evaluation methods in simulations, nursing students were able to develop their competency and achieve higher levels of satisfaction due to the anxiety reduction path that was created through formative feedback. The effectiveness of structured clinical evaluation was also supported by Motefakker et al. (2022), who showed that the Mini

Clinical Evaluation Exercise had better clinical competency results compared to other assessment methods. The effectiveness of competency-based training programs was also supported by Chen et al. (2022), who showed through meta-analysis that it improved critical thinking and communication skills and clinical care competency in newly graduated nurses. Overall, the study by Costa and Monger (2024) and Al-Ratrout et al. (2025) demonstrated the need to include emotional skills training, which included clinical judgment, communication, and safety attitudes, into competency-based assessment systems.

### **1.3 Application of Benner's Novice to Expert Theory in Competency Development**

Benner's Novice to Expert Theory is widely adopted in nursing programs that use it as an approach in monitoring student progress from novice to expert. Song et al. (2024) found that the theory was useful in determining critical soft skills like personal growth, professionalism, teamwork, and caring roles, which had specific clinical indicators for evaluation and professional growth. The theory has also been applied in transition programs for newly graduated nurses. Graf et al. (2020) emphasized that to minimize transition shock and turnover, nurses must achieve advanced beginner levels. Soola et al. (2022) proved that expert nurses in emergency settings completed quicker and better-informed triage decisions than novice nurses. Therefore, this study proved that experience-based learning should be tailored according to the level of competency of individual nurses. Alruwaili et al. (2024) found that the professional preparedness of intern nursing students was moderate, and this matched Benner's stages of professional development because of education and internship. In addition, Rahmati et al. (2025) proved that clinical experience, psychological, and organizational factors may influence nurses' clinical performance, decision-making, and overall competency development.

### **1.4 Nurses' Perceptions, Professional Identity, and Experiential Learning in Competency-Based Frameworks**

The studies showed that nurses' professional identity development and competence development were greatly impacted by experiential learning methods, which functioned in competency-based education systems. Kaldheim et al. (2022) found that interprofessional simulation-based learning helped perioperative nurses develop competence in dealing with acute clinical situations and in developing professional identity through the skills learned, which were later used in real-world settings after completing their education. Xiao et al. (2025) found that narrative-based teaching methods helped vocational nursing interns develop professional identity and competence, which helped them grow emotionally and professionally during their internship. This is further reinforced by the study of

Qin et al. (2024), which proved that senior nursing students with high perceptions of professional readiness developed strong professional identities. The method of case-based learning also assisted in enhancing critical thinking skills, which developed problem-solving skills while enhancing educational satisfaction among students, as proved by Koto-Shimada et al. (2023) and Wang et al. (2023). Furthermore, Mlambo et al. (2021) proved that professionals need continuous professional development in order to attain lifelong learning and develop their professional standards, but this process needs organizational backing and learning opportunities.

### **1.5 Research Gap**

The research on competency-based nursing education has produced numerous studies, yet fundamental gaps still exist. The conducted studies focused on two areas: knowledge and skill development. There is a lack of studies that comprehensively evaluate both knowledge and clinical skills together within a structured competency-based assessment based on Benner's framework (Chen et al., 2022; Motefakker et al., 2022). The absence of structured competency frameworks that directly followed Benner's Novice to Expert Theory created difficulties for organizations to assess their staff members' development through various competency stages (Costa & Monger, 2024). Although existing research includes both quantitative and qualitative studies, only a few studies have used mixed-method research to examine both measurable results and nurses' firsthand experiences with competency-based assessment (Kaldheim et al., 2022). In addition, the study did not explore how nurses evaluate their professional development through Benner's competency levels during their assessment process. To fulfil these research gaps, the study derived the following hypotheses:

**H1a:** "There is a significant difference in the knowledge scores of staff nurses before the implementation of competency-based assessment."

**H1b:** "There is a significant difference in the knowledge scores of staff nurses after the implementation of competency-based assessment."

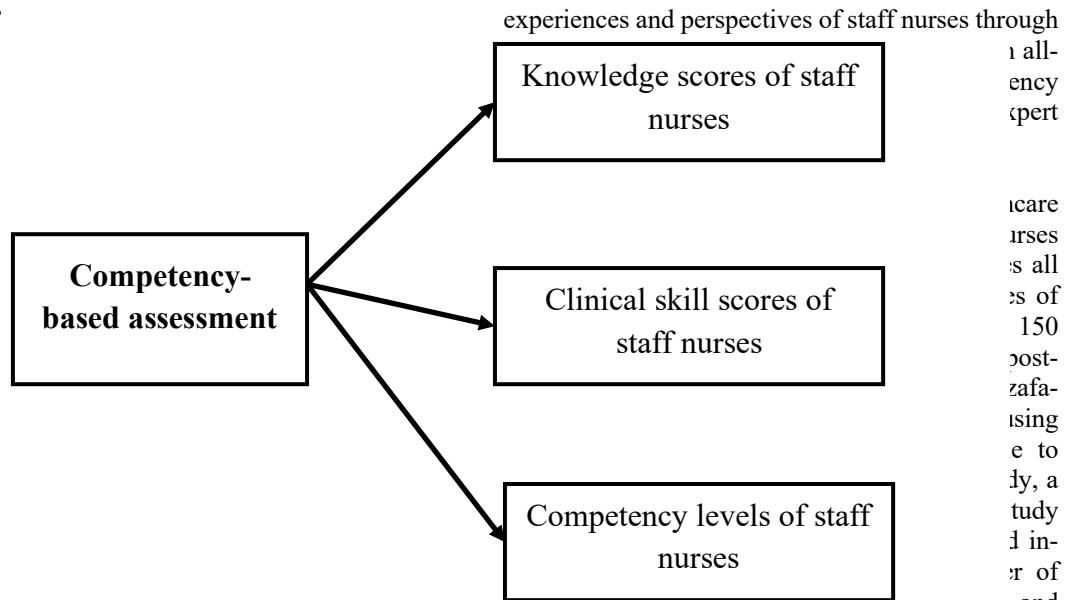
**H2a:** "There is a significant difference in the clinical skill scores of staff nurses before the intervention."

**H2b:** "There is a significant difference in the clinical skill scores of staff nurses after the intervention."

**H3a:** "There is a significant difference in the competency levels of staff nurses before the intervention."

**H3b:** "There is a significant difference in competency levels of staff nurses after the

intervention.”



**Figure 1: Conceptual Framework**  
(Source: Self-prepared by Author)

## 2. Objectives of the Study

- Obj1.** To assess and compare the knowledge scores of staff nurses before and after the implementation of competency-based assessment.
- Obj2.** To evaluate and compare the clinical skill scores of staff nurses before and after the intervention.
- Obj3.** To examine the differences in competency levels of staff nurses before and after the intervention.
- Obj4.** To explore the experiences and perceptions of staff nurses regarding the implementation of competency-based assessment based on Benner's Novice to Expert Theory.
- Obj5.** To examine how nurses perceive their progression across Benner's stages (novice to expert) during the intervention.

## 3. Research Methodology

### 3.1 Research Design

This Experimental study utilizes a Sequential Explanatory Mixed-Methods design, where quantitative data is collected, and evaluations are conducted both before and after the program to assess the effectiveness of a competency-based approach. The qualitative data is collected in the form of semi-structured interviews to explain and interpret quantitative data by examining the experiences of staff nurses regarding their competency development in Benner's Novice to Expert Theory.

### 3.2 Research Approach

The study uses a mixed-methods approach because it enables the researcher to assess the effectiveness of the competency-based intervention design by pre-testing and post-testing. At the same time, the intervention design involves gaining actual

experiences and perspectives of staff nurses through

Knowledge scores of staff nurses

Clinical skill scores of staff nurses

Competency levels of staff nurses

participants for a quantitative study is justified and supported by Kaldheim et al. (2023), who conducted a qualitative study for a similar purpose, recruiting a total of 16 participants.

### 3.4 Intervention

The intervention is carried out over a period of 4 weeks with the aid of Benner's Novice to Expert Theory, which helps the staff nurse develop their competencies in stages. The program provides a competency assessment rubric that aligns stages with corresponding levels. The program uses structured skill demonstrations to teach clinical procedures that are followed by reflective feedback sessions that assist learners in developing critical thinking skills and self-assessment skills. The program uses case-based simulation to create clinical scenarios that allow learners to practice decision-making and learning with hands-on experience. The intervention targets both fundamental nursing practices and advanced nursing practices. The fundamental nursing practices include medication administration, wound care, and IV cannulation. The advanced nursing practices include ventilator care, central line care, and emergency protocol handling. The comprehensive approach facilitates the development of all three competency domains, including cognitive skills, psychomotor skills, and affective skills (Beiranvand et al., 2022).

### 3.5 Data Collection Tools

The study uses quantitative data collection methods in which data is collected through a set of questions in a questionnaire that the researcher has developed based on previous assessment tools used in previous studies. The questionnaire is meant to assess the knowledge level, skill level, and competency level of staff nurses. The questions related to competency level are based on Manero-Solanas et al.'s (2025) study, and the questions related to knowledge level are based on Jogi et al. (2024). The study utilizes modified items that were developed by the authors according to specific study requirements in order to

assess the reliability of the tool using pilot testing. Additionally, the clinical skill data is collected through the self-structured questionnaire developed by the researcher. A semi-structured interview guide is used in the study to collect qualitative data from participants. The guide contains open-ended questions that assess key themes regarding participants' skill development, their confidence levels, their difficulties in advancing their competency levels, and their feedback experiences. The method provides the study with flexible options in order to obtain complete insights into nurses' attitudes.

### 3.6 Tools and Techniques

The study used SPSS software and Microsoft Excel to carry out quantitative data analysis. The quantitative data is summarized using descriptive statistics, which include mean value and standard deviation measurements. The paired t-test is used for the analysis of the quantitative data to compare the knowledge, clinical skills, and competency level of the pre-test and post-test, which enables the measurement of success. Thematic analysis was used for the analysis of the qualitative data, with NVivo software used to support the analysis process. The process begins with transcription of the interview data, which is used to develop codes that identify the essential elements of the research. The study uses interpretation to analyze the experiences and perceptions of the participants, which enables them to understand their progression through their research study while studying the effects of the intervention.

### 3.7 Ethical Considerations

The study follows the general ethics of research. The Institutional Ethics Committee approves the research before the researcher initiates the data collection process. The researcher gives the research participants complete information about the study, and their consent should be obtained before including them in the research. The researcher maintains complete confidentiality of the research participant's information, using the collected data only for research purposes. The research participant can choose to be in the study or leave the study at any time, as their participation in the research is completely voluntary.

## 4. Results

This section includes patterns and comments of study from examining the data. The findings have been organized based on the characteristics of the study participants, objectives of the study, and underlying theoretical assumptions. The hypotheses are supported by empirical evidence from qualitative analysis, presented in tabular form, followed by detailed analyses. The tables make understanding easier, and the narrative explanation accentuates the importance of the findings in relation to the study.

**Table 1 Reliability and validity statistics**

| Variables                              | KMO and Bartlett's Test | Cronbach's Alpha | Sig  | N of items |
|----------------------------------------|-------------------------|------------------|------|------------|
| Knowledge Scores Pre Intervention      | .888                    | .924             | .000 | 5          |
| Knowledge Scores Post Intervention     | .798                    | .946             | .000 | 5          |
| Clinical Skill Score Pre Intervention  | .859                    | .894             | .000 | 5          |
| Clinical Skill Score Post Intervention | .865                    | .908             | .000 | 5          |
| Competency Levels Pre Intervention     | .823                    | .901             | .000 | 5          |
| Competency levels Post Intervention    | .854                    | .883             | .000 | 5          |

Table 1 presents the values for KMO, Bartlett's test, and the Cronbach's alpha reliability coefficients of

the variables. The participant group consists of 6 measured interventions by 5 assessment items per construct. The KMO value for Knowledge Scores Pre Intervention was .888, the Cronbach's alpha value was .924 and the significance value was .000. The KMO value for Knowledge Scores Post Intervention was .798 while the Cronbach's Alpha value was .946 and the significance value was .000. The value of Clinical Skill Score Pre Intervention was .859 and .894 at Cronbach's Alpha and .000 at significance value. Clinical Skill Score Post Intervention had a KMO value of .865 and a Cronbach's Alpha value of .908 with a significance value of .000. The KMO value for Competency Levels Pre Intervention was .823 while the Cronbach's Alpha value was .901 and the significance value was .000. However, Competency Levels Post Intervention had a value of .854 for KMO and .883 for Cronbach's Alpha and .000 for significance. All the KMO values were greater than the acceptable .70, indicating that the sampling was adequate. The results of Bartlett's Test for all constructs indicate that there is sufficient correlation between all items. Cronbach's Alpha coefficients for all the variables were above the .80 level, indicating high internal consistency of the items grouped under each construct. The overall findings indicated that the knowledge scores and clinical skill scores and competency levels were valid and reliable over the pre and post assessment phases.

### 5.1 Result based on demographics

**Table 2 Demographic Profile of Nurses**

| S No. | Demographic Characteristics | Category    | Frequency | Percent |
|-------|-----------------------------|-------------|-----------|---------|
| 1.    | Age                         | 20-25 years | 26        | 17.3    |
|       |                             | 26-30 years | 25        | 16.7    |
|       |                             | 31-35 years | 35        | 23.3    |
|       |                             | 36-40 years | 32        | 21.3    |
|       |                             |             |           |         |

|    |                                    |                           |     |       |
|----|------------------------------------|---------------------------|-----|-------|
|    |                                    | Above 40 years            | 32  | 21.3  |
| 2. | Gender                             | Female                    | 73  | 48.7  |
|    |                                    | Male                      | 77  | 51.3  |
| 3. | Education Qualification in Nursing | High School               | 31  | 20.7  |
|    |                                    | Intermediate              | 29  | 19.3  |
|    |                                    | Diploma                   | 23  | 15.3  |
|    |                                    | Graduate                  | 33  | 22.0  |
|    |                                    | Postgraduate              | 34  | 22.7  |
| 4. | Years of Clinical Experience       | Less than 1 year          | 39  | 26.0  |
|    |                                    | 1-3 years                 | 30  | 20.0  |
|    |                                    | 4-6 years                 | 44  | 29.3  |
|    |                                    | Above 6 years             | 37  | 24.7  |
| 5. | Study Setting                      | Medanta Lucknow (Private) | 150 | 100.0 |

|    |                   |                                                |    |          |
|----|-------------------|------------------------------------------------|----|----------|
|    |                   | e<br>Tertiar<br>y<br>Health<br>Care<br>Centre) |    |          |
| 6. | Marital<br>Status | Unmarr<br>ied                                  | 13 | 8.7      |
|    |                   | Married                                        | 94 | 62.<br>7 |
|    |                   | Divorce                                        | 31 | 20.<br>7 |
|    |                   | Widow<br>ed                                    | 12 | 8.0      |

Table 2 shows the demographic profile of the respondents, providing details of their background characteristics within the single-site study setting at Medanta Lucknow, a private tertiary health care centre. The age-wise distribution shows that 17.3% of respondents belong to the 20-25 years age group, with 26 respondents, while 16.7% of respondents belong to the 26-30 years age range, with 25 respondents. The second category comprises 23.3% of respondents, with 35 respondents aged between 31 and 35 years, whereas 21.3% respondents, with 32 respondents, are in the age category of 36-40 years, and 21.3% of the respondents, with 32 respondents, are more than 40 years old. It can be observed that the age of the respondents includes an equal proportion of three nursing categories, such as new nurses, mid-level nurses, and experienced nurses, due to the reason that they possess varied experiences in health care. Gender distribution among the sample is indicated, where Female participants accounted for 48.7% with 73 respondents, while Male participants accounted for 51.3% with 77 respondents. Almost equal representation of the two genders ensures diverse perspectives and experiences about nursing practice and professional duties in the healthcare setting. Education levels among nursing participants indicate that 15.3% with 23 respondents attained diploma qualifications, 19.3% with 29 respondents have intermediate education, 20.7% with 31 respondents have high school education, 22.0% with 33 respondents are graduates, and 22.7% with 34 respondents are postgraduates. The educational distribution reveals the involvement of respondents

with different levels of academic preparation and professional readiness. As far as the years of clinical experience among the respondents go, it is evident that 26.0% of the respondents with 39 respondents have been in practice for less than 1 year, 20.0% with 30 respondents have been practicing for 1-3 years, 29.3% of the respondents with 44 respondents have practiced for 4-6 years, and 24.7% of the respondents with 37 respondents have been practicing for more than 6 years. Some nurses are new to the profession, and others are experienced in dealing with patients and making clinical decisions. The study setting variable further confirms that all 150 participants were recruited from Medanta Lucknow, a private tertiary health care centre. The study found that 8.7% of participants, with 13 respondents, remained unmarried, 62.7% of participants, with 94 respondents, maintained their married status, 20.7% of participants, with 31 respondents, had experienced divorce, while 8.0% of participants, with 12 respondents, had lost their spouses through death. The distribution of marital status among respondents shows diverse personal and social backgrounds, which create different patterns of life responsibilities, emotional experiences, and work participation in the nursing field.

## 5.2 Quantitative Finding

**Table 3 Paired Samples Statistics**

| Paired Samples Statistics |                                 |             |             |                       |                               |
|---------------------------|---------------------------------|-------------|-------------|-----------------------|-------------------------------|
|                           |                                 | Mea<br>n    | N           | Std.<br>Devia<br>tion | Std.<br>Err<br>or<br>Me<br>an |
| P<br>ai<br>r<br>1         | Knowle<br>dge<br>Scores<br>Post | 16.3<br>333 | 1<br>5<br>0 | 6.854<br>84           | .55<br>970                    |
|                           | Knowle<br>dge<br>Scores<br>Pre  | 14.7<br>600 | 1<br>5<br>0 | 6.651<br>11           | .54<br>306                    |
| Pai<br>r 2                | Clinical<br>Skill               | 15.7<br>667 | 1<br>5<br>0 | 6.627<br>60           | .54<br>114                    |

|          |                          |         |     |         |        |
|----------|--------------------------|---------|-----|---------|--------|
|          | Score Post               |         |     |         |        |
|          | Clinical Skill Score Pre | 14.2333 | 150 | 5.89325 | .48118 |
| Paired 3 | Competency Levels Post   | 16.3800 | 150 | 6.60757 | .53951 |
|          | Competency levels Pre    | 14.5733 | 150 | 5.98695 | .48883 |

Table 3 presents the paired sample statistics for the participant group, highlighting pre-assessment and post-assessment scores related to knowledge, clinical skills, and competency levels. The results show that there were improvements in all three studied constructs following the intervention. The mean value of the post assessment (mean value) is 16.3333 for Knowledge Scores, whereas the mean value of the pre assessment (mean value) is 14.7600. This improvement of the average score means that the participants' knowledge has improved following the intervention. The difference between the average value of the 6.85484 post-assessment and the average value of the 6.65111 pre-assessment is indicated by the standard deviation values. The low SE mean values (.55970 and .54306) are found representing stability and reliability of sample mean values. The mean value of Clinical Skill Score on post-assessment was 15.7667, which is higher than the mean value of Clinical Skill Score on pre-assessment (14.2333). This finding is an indication of the improved clinical skills of participants after the intervention. The high value of standard deviations [6.62760 and 5.89325] shows the differences among the clinical performance levels of the participants. Further, the low standard error mean values of .54114 and .48118 indicate consistency in the values of the sample means obtained. Analogously, the mean value of Competency Levels increased from pre-assessment (14.5733) to post-assessment (16.3800). This is an indication of the success of the intervention in improving the competency levels of the participants. The values of standard deviation (6.60757, 5.98695) suggest there is some degree of variation in the

responses of the participants, and the standard error mean values were .53951 and .48883, which remained relatively low, supporting the reliability of the mean scores obtained. In general, paired sample statistics show that scores post-assessment are higher in the participant group in comparison to pre-assessment scores for knowledge, clinical skills, and competency levels. The mean scores for all constructs improved, indicating the effectiveness of the intervention in improving the competency of the participants in their performance. Moreover, since the standard deviations were small and the standard error of the mean was also low, the data were consistent, and the sample estimates were stable and reliable.

**Table 4 Paired Samples Test**

| Paired Samples Test |                           |                    |                    |                     |                                           |             |    |      |            |
|---------------------|---------------------------|--------------------|--------------------|---------------------|-------------------------------------------|-------------|----|------|------------|
|                     |                           | Paired Differences |                    |                     |                                           | t           | df | Sig. | (2-tailed) |
|                     |                           | Mean               | Standard Deviation | Standard Error Mean | 95% Confidence Interval of the Difference |             |    |      |            |
|                     |                           |                    |                    |                     | Lower Bound                               | Upper Bound |    |      |            |
| Paired 1            | Knowledge Scores Post-Pre | 15.7667            | 6.62760            | .54114              | 2.558                                     | 8.975       | 3  | .004 | .002       |

|                       |                               |     |      |     |     |     |     |     |     |
|-----------------------|-------------------------------|-----|------|-----|-----|-----|-----|-----|-----|
| P<br>a<br>i<br>r<br>2 | Clinical Skill Score Post-Pre | 1.5 | 6.01 | 4.9 | 5.2 | 2.4 | 3.1 | 1.4 | 0.2 |
| P<br>a<br>i<br>r<br>3 | Competency Level Post-Pre     | 1.8 | 7.17 | 5.8 | 6.5 | 2.9 | 3.0 | 1.4 | 0.2 |

Table 4 shows the results of the paired samples test, where there is an evaluation of knowledge score and clinical skills score, as well as competency level, both before and after assessment on 150 sample size. The mean difference in Knowledge Scores Post-Pre for pair one is 1.57333, and "the standard deviation is 6.24161, and the standard error mean is .50963. The 95% confidence interval is .56631 and 2.58036. The statistically calculated t value is 3.087 with 149 degrees of freedom and a significance value of .002. For Pair 2, the mean difference is 1.53333 with a standard deviation of 6.01638 and a standard error mean of .49124. The 95% confidence interval ranges from .56265 to 2.50402. The t value calculated is 3.121, and df is 149 with a significance value of .002. Competency Levels Post-Pre have a mean difference of 1.80667, a standard deviation of 7.17443, and a standard error mean of .58579 for Pair 3. The 95% confidence interval ranges from .64914 to 2.96419. The t value calculated is 3.084 with 149 degrees of freedom and a significance value of .002." The findings indicate a statistically

significant difference between pre and post-assessment at the .05 level in knowledge scores, clinical skill scores, and competency levels. The overall results indicate that all variables measured have significant difference between evaluation periods, representing improvement in knowledge, clinical skill and competency scores, in post evaluation.

### 5.3 Qualitative Finding



Figure 2 Word Cloud

As depicted in Figure 2, the word cloud indicates that the participants' perceptions regarding competency-based assessment are clinical skills, patient care, confidence, and continuous learning. The assessment process shows a clear need for ongoing guidance, together with supervisory support and senior staff feedback. The assessment system, together with repeated learning experiences, supports students in developing practical skills, making good decisions, and managing difficult medical situations. The participants during this period showed that they needed ongoing support together with organized mentoring because they faced challenges with their workload and difficult tasks, and their ability to manage clinical work. The participant responses indicate a preference for competency-based learning environments, which include practical learning experiences, continuous guidance and skill development, and professional recognition and development support.

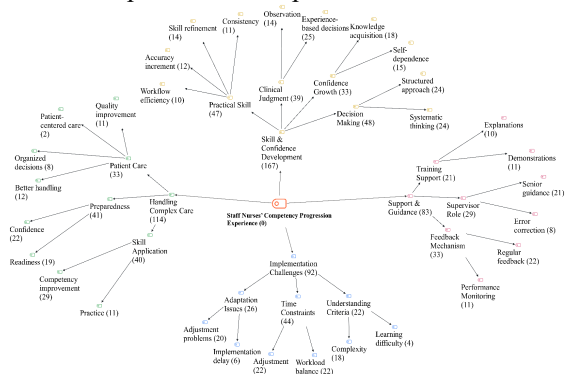


Figure 3 Code Cloud

As depicted in Figure 3, the Code cloud displays participant views about their assessment abilities, their development of skills and confidence, their need for support and guidance, their preparedness levels, and their competency assessment progress. The learning and evaluation process involves regular feedback, supervision, well-structured training programs, and instructions. The acquisition of skills and decision-making in the context of clinical practice, as well as patient management, requires an

# An Experimental Study on the Effectiveness of Competency-Based Assessment Based on Benner's Novice to Expert Theory in Enhancing Knowledge and Clinical Skills of Staff Nurses in Basic and Advanced Nursing Procedures

educational framework, along with continuous skill development. They faced challenges during implementation, time constraints, learning, adaptation, and workflow management, which highlighted their need for mentorship and structuring. The responses show that the participants prefer a competency-based learning environment that is supportive and that offers practical skill development, confidence enhancement, structured guidance, regular feedback, and opportunities for professional improvement.



**Figure 4 Thematic Analysis (Max Map)**

As depicted in Figure 4, the thematic Analysis of Staff Nurses' Competency Progression Experience, the responses of the participants are distributed across four major themes, namely Skill & Confidence Development, Handling Complex Care, Support & Guidance, and Implementation Challenges.

## ➤ Skills and Confidence Development

In the Theme Skill & Confidence Development, the participants highlighted aspects related to Decision Making, Practical Skill, Clinical Judgment, and Confidence Growth. The responses associated with Decision Making include a structured approach and Systematic thinking, whereas Confidence Growth consists of Experience-based decisions, Knowledge acquisition, Self-dependence, and Observation. Practical Skill further includes Skill refinement, Accuracy increment, Consistency, and Workflow efficiency. The emphasis on these areas reflects the progression of professional competence, confidence enhancement, and clinical reasoning among staff nurses during their practical exposure and competency-based learning experiences.

*"Practical skills also become more refined and efficient with regular practice."* (Respondent 1)

The statement highlights the fact that routine nursing practice aids in improving the skills of nursing in a practical setting. Constant familiarity with clinical procedures helps develop efficiency in task completion.

*"More clarity and control in work."* (Respondent 2)

This quotation shows how the improvement through competency levels leads to better comprehension regarding the clinical duties and processes. Greater knowledge and practice result in improved control over the clinical duties and processes of decision-

making. Knowledge about the work situation makes one perform better during patient care practices.

*"Tasks are performed with more attention"* (Respondent 2)

It is evident from the quotation above that competency-based assessment promotes the development of increased concentration and attentiveness when performing clinical duties. Continuous assessment and training help in enhancing meticulousness and precision in the process of conducting clinical practices. Enhanced attentiveness in performing the clinical tasks ensures consistency in providing services to patients.

*"Better handling of responsibilities."* (Respondent 8)

This quote signifies that ongoing learning and clinical exposure will help in managing professional duties in a better manner. Experience helps build more confidence and knowledge about how to perform clinical duties. Effective practical skills and decision-making abilities play a crucial role in ensuring better efficiency in performing tasks.

*"Decision-making becomes more accurate"* (Respondent 13)

This quote shows that the more one is exposed to clinical activities, the better he/she becomes at making sound judgment. More knowledge about clinical activities and more experience help improve the judgment process. Improved judgment about the condition of patients leads to well-organized clinical decision-making.

## ➤ Handling Complex Care

The topic of Managing Complicated Care contains the sub-topics of Preparedness, Skill Usage, and Patient Care. The sub-sub themes of Preparedness are Confidence and Readiness. The sub-sub themes of Skill Usage are Competency development and Practice. Patient Care has been divided into Improved Management, Quality Improvement, Decision-making, and Patient-oriented care.

*"Patient care becomes more accurate"* (Respondent 3)

This quote shows that with competency-based testing, competence in dealing with patients is enhanced by making decisions on complicated patient cases more precisely. Consistent practice and clinical evaluation enhance alertness while engaging in patient-care practices. Practical skills acquired from this make it possible to handle complicated patient cases effectively.

*"Learning more practical and skill-oriented."* (Respondent 3)

This quotation shows that the process of learning is becoming more concentrated on the practical application of skills. The more a person is involved in clinical activities, the more he will be able to understand the procedure and apply his knowledge in practice. Such an approach ensures successful preparation for clinical duties.

*"Better clinical performance."* (Respondent 9)

This shows that constant learning and hands-on experience lead to better performance in clinical practice. With more exposure to patient care procedures, the practitioner will be more efficient and confident in performing clinical duties. It will become easier for the practitioner to organize tasks. *"Skills improve with repeated assessment."* (Respondent 13)

The quoted statement is true because continuous evaluation leads to the steady development of clinical skills through the performance of the activity. Consistent review of performance ensures improved consistency, precision, and efficiency in conducting clinical procedures. The continuous evaluation process will also help to establish areas where more work needs to be done.

*"Ensures better preparation"* (Respondent 18)

The quoted statement is true because continuous evaluation leads to the steady development of clinical skills through the performance of the activity. Consistent review of performance ensures improved consistency, precision, and efficiency in conducting clinical procedures. The continuous evaluation process will also help to establish areas where more work needs to be done.

#### ➤ **Support & Guidance construct**

There are three subthemes under the Support & Guidance theme: Supervisor Role, Feedback Mechanism, and Training Support. The Supervisor Role theme includes two themes, namely Senior Guidance and Error Correction. The Feedback Mechanism theme, on the other hand, includes two themes: Regular Feedback and Performance Monitoring. Finally, there are two themes under the Training Support category, namely Demonstrations and Explanations.

*"step-by-step guidance"* (Respondent 4)

The statement shows that the provision of instructions for performing tasks in a step-by-step process is essential to ensure better comprehension of the procedures in practice. The consistent training by seniors and tutors leads to enhanced performance and systematic accomplishment of the tasks. Such assistance aids in minimizing mistakes and builds confidence while performing clinical tasks.

*"Help was available"* (Respondent 6)

This quotation indicates that the constant availability of assistance in clinical practice aids in a more efficient comprehension of clinical processes. Assistance provided by senior personnel and tutors is useful in overcoming problems and facilitating better procedure understanding. Assistance provided timely boosts confidence and minimized confusion when handling patients.

*"Seniors assisted during clinical tasks".* (Respondent 12)

It shows that the assistance by senior management in clinical activities will help gain a greater understanding and ability to perform clinical activities. Assistance offered during clinical activity

will aid in becoming more accurate and knowledgeable about the process involved. Assisting in patient care activities will lead to improvement in skills and fewer mistakes.

*"Supervision and mentoring"* (Respondent 15)

The quotation conveys the fact that supervision and mentoring in clinical settings aid the learning process and professional development. Guidance by experienced practitioners makes one understand clinical processes and how to perform clinical tasks. Mentorship helps build one's confidence, accuracy, and judgment in undertaking clinical tasks.

*"Guidance during clinical tasks"* (Respondent 20)

This is an indication that clinical guidance is very helpful in improving understanding as well as the performance of clinical duties for patients. Assistance will help increase proficiency when executing clinical duties.

#### ➤ **Implementation Challenges**

Time Constraints, Adaptation Problems, and Understanding Criteria are three sub-topics that are included in Implementation Challenges. These three subtopics can be found under Time Constraints, Adaptation Problems, and Understanding Criteria, respectively. The challenges faced by the staff nurses in their implementation are captured under this topic, as they should be practiced competently.

*"Less time was available"* (Respondent 5)

In the quote above, there is a mention of how the lack of sufficient time due to busy schedules makes the completion of assessments difficult. It is hard to conduct evaluations since there is not enough time when conducting the assessment process. There are many constraints when doing this kind of task.

*"Skills improve with repeated evaluation"* (Respondent 7)

The quote shows that continuous evaluation contributes to the steady improvement of clinical skills during practice. Repeated assessment strengthens precision, consistency, and confidence in performing clinical procedures.

*"Time constraints created pressure"* (Respondent 14)

From this quote, one can observe that the availability of limited time within the course of clinical work adds to the pressures of accomplishing assessment tasks. The lack of time because of the various duties that must be performed creates problems in assessing patient needs. This creates challenges when conducting clinical work.

*"Understanding criteria"* (Respondent 18)

The quote brings to light that assessing criteria involves more effort in the practice setting. Not having clear standards in evaluation makes it difficult to understand the competency criteria. More continuous learning is required to make the right assessment. This problem makes it difficult to conduct the assessment process successfully.

*"Time limitation"* (Respondent 19)

As seen from the quote above, a lack of enough time while on clinicals is the source of challenges in doing assessment work efficiently. Consistent clinical activities decrease the chances of performing assessment work and documenting competence. Lack of time causes distractions and makes it hard to coordinate assessment activities.

#### ➤ **Summary of the theme**

In all, the concepts "Skills and Confidence Development," "Managing Complex Patient Care," "Support and Guidance," and "Challenges in Implementation" all represent the gradual process by which clinical competencies, professional confidence, and efficiency are developed by staff nurses in the course of competency-based practical learning. The results indicate that repeated and continued practical experience with regard to clinical tasks leads to better decision-making skills, stronger clinical judgment, and more efficient execution of practical skills in terms of increased precision, consistency, efficiency, and organization. From their accounts, continued participation in the processes of patient care improves clarity in task assignments, promotes confidence, and helps in dealing with various clinical situations. Additionally, the results indicate that practical experience in managing the complexities of patient care makes individuals more organized, efficient, and effective in handling various clinical challenges. The role of supportive learning environments became another significant theme in the literature, whereby supervision, mentorship, demonstration, explanation, constructive feedback, and support from more experienced staff helped to build up the nurses' confidence, decrease their errors, and enhance their procedural knowledge when conducting clinical tasks. At the same time, the barriers to the successful implementation of the clinical competencies were noted, such as increased workload, lack of time, difficulty in balancing between assessment and clinical responsibilities, as well as problems with comprehending the competence requirements, all of which affected the successful implementation of the assessment process. The findings could be explained by applying Benner's theory of Novice to Expert, suggesting that clinical competency develops gradually under the influence of consistent clinical exposure, experiential learning, practice, and performance in the actual patient care setting. The progress from a low level of confidence and dependency to organized decision making, skill improvement, and appropriate management of patients demonstrates the shift from novice to expert status.

#### **5. Discussion**

The study investigated the effect of competency-based assessment on the knowledge, clinical skills and competency of nurses. The quantitative results showed that there was a "significant difference

between the knowledge scores in the pretest (14.76) and post test (16.33) with a mean difference of 1.57 and a p value of .002; a significant difference was found between the clinical skill scores in the pretest (14.23) and post test (15.77) with a mean difference of 1.53 and a p value of .002; and a significant difference was found between the competency scores in the pretest (14.57) and post test (16.38) with a mean difference of 1.81 and a p value of .002." Qualitative results confirmed these findings with repeated practical exposure, structured feedback, mentorship and ongoing learning, improving decision making, practical skills, confidence and patient care. Results are consistent with the Novice to Expert model of Benner, a movement from novice to advanced beginner.

The results of this study confirmed previous research on competency-based nursing education and Benner's Novice to Expert nursing framework. After the intervention, the quantitative outcomes showed significant improvement in both the knowledge and clinical skills of the nurses, and the qualitative results showed that repeated clinical exposure and mentorship increased nurses' confidence and decision-making skills, and improved how they managed patient care. The results are in line with Song et al. (2024), who highlighted that clinical judgment, decision making, collaboration, and professional confidence are among the crucial nursing skills. Likewise, the present study participants indicated greater confidence, systematic thinking, and accuracy in clinical performance. The results are also similar to those of Soola et al. (2022), who concluded that experiential learning and repeated clinical exposure enhanced the triage decision-making of the Nurse. The repeated evaluation and ongoing practice in the present study led to the enhancement of practical skills, clinical judgment and readiness to deal with complex patient-care situations. Similarly, the increase in post-intervention knowledge and competency scores corroborates the findings of AlRatrou et al. (2025), indicated that competency-based programs had significant effects on nurses' knowledge, skills, and professional attitudes. Similarly, competency-based training was found to enhance critical thinking, communication skills, and clinical competency by Chen et al. (2022), which is consistent with the current results with regards to an organized and systematic approach to clinical decision making and enhanced practical skills. The qualitative results also emphasized the role of mentoring, supervision and ongoing feedback in the development of competency. The results align with those of Anthamatten and Pitts (2024), who identified mentorship and entrustable professional activities (EPA) as key components of competency-based assessment. Likewise, Önal and İntepeler (2024) found a consistency between self-assessed and managerial competency evaluation, and in the

current study, increased self-confidence scores and increased competency scores are found. Furthermore, Lemetti et al. (2022) and Clemett and Raleigh (2021) highlighted the importance of reliable competency assessment tools, which support the methodological strength and reliability of the present study.

These results have clinical implications for the practice of nursing. Structured competency-based assessments can improve consistency in evaluating knowledge, clinical skills, and overall competency. Continuous professional development modules, simulation training, and mentorship programs support practical skill acquisition, confidence building, and effective patient care. There are available continuous professional development modules which involve practical sessions and simulation training to ensure skills are acquired, and confidence is built. Regular mentorship programs enable guided learning, minimizing mistakes and improving patient care quality. The policy-driven implementation of competency assessment by stages could facilitate the standardization of nursing education, the gradual progression of the novice nurse through the stages towards becoming an expert practitioner, as suggested by Benner. These collectively support the development of clinical skill in an evidence-based, competency-driven way to improve overall healthcare quality and nurse preparedness.

## 6. Conclusion

The study results confirm that competency-based assessment with the guidance of Benner's Novice-to-Expert continuum is effective in enhancing the knowledge, clinical skills and competency of staff nurses. Results for the quantitative data support the effectiveness of the intervention, as significant improvement was obtained in all three constructs. The measurement scales showed high reliability and validity, which helps to validate the results of the study. Qualitative observations highlighted that repeated practical exposure, scaffolding in the practical sessions, structured feedback and mentorship help to improve decision making, practical skills, confidence and caring for patients. These qualitative findings are in addition to the quantitative enhancements and provide an understanding of how deliberate support and learning-by-doing support movement across Benner's stages.

There are some limitations in the study. It took place in one health centre and may not be representative. The follow-up period was brief, and there might be a self-report bias in the qualitative interviews. Although there are some caveats, the study offers some insights into the implementation and effects of competency-based interventions.

Longitudinal studies are recommended to examine the trajectory of nurses' progression through the stages over time, multi-center studies to

increase the generalizability of the findings, and the use of simulation technology or competency tracking systems with artificial intelligence to monitor and give individual feedback in real time to optimize nurses' professional development. Finally, this study underscores the value of organized, phased, competency-based approaches to nursing education and practice, to better prepare nurses for their roles, and to deliver better patient care.

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