

# Current Analysis of Evidence-Based Competencies among Clinical Nurses and Influencing Factors

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## Abstract

**Objective:** To investigate the evidence-based competencies of clinical nurses at a tertiary-level hospital in Wuhan and their influencing factors, providing a reliable theoretical basis for implementing evidence-based nursing interventions in clinical practice. **Methods:** A questionnaire survey was conducted among 120 nurses at a tertiary-level general hospital in Wuhan using the Clinical Nurse Evidence-Based Competency Survey and the Chinese version of the Evidence-Based Nursing Practice Barriers Scale. **Results:** 84% of the clinical nurses scored in the slightly poor range for the original total score of their evidence-based qualities, while 4% scored in the very poor range; 11% of the clinical nurses had a moderate impact score for the original total of their barriers in evidence-based nursing practice, and 73% had a severe impact score, indicating the presence of obstacles in evidence-based nursing practice. Independent factors influencing evidence-based competency included professional title, educational background, and evidence-based practice barriers score ( $P < 0.05$ ). Nurses with higher titles, higher education levels, and lower evidence-based practice barriers scores demonstrated superior evidence-based competency. **Conclusion:** The overall status of evidence-based practice among clinical nurses requires improvement. Hospitals should provide organizational support, strengthen evidence-based nursing education through a combination of elite training and tiered training approaches, enhance hardware facilities, and promote the development of evidence-based nursing.

## Keywords

Evidence-Based Nursing, Clinical Nurses, Evidence-Based Competencies

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## 1. Introduction

Evidence-based nursing (EBN) refers to the careful, accurate, and judicious application of the best available research evidence by nurses. This practice integrates nurses' professional skills and clinical experience with consideration of patients' values and preferences. The combination of these three elements enables the development of nursing plans tailored to patients' specific circumstances and the provision of corresponding nursing interventions [1]. As the primary practitioners of evidence-based nursing, nurses' practical skills in evidence-based nursing play a crucial role in its successful implementation [2]. The evidence-based competencies of clinical nurses directly impact the execution and outcomes of evidence-based nursing [3]. The fundamental competencies of evidence-based nursing practitioners encompass evidence-based knowledge, attitudes, behaviors, and skills. These constitute the core competencies of evidence-based nursing, embodying a comprehensive capability and serving as the foundation for cultivating evidence-based thinking [4]. This study aims to investigate the evidence-based competencies and current barriers to evidence-based nursing practice among clinical nurses at a tertiary hospital in Wuhan, providing a theoretical basis for subsequent evidence-based nursing interventions.

## 2. Material and Methods

### 2.1. Participants

This study employed convenience sampling to select 120 clinical nurses from a tertiary hospital in Wuhan for investigation. Taking the clinical nurses of a large tertiary grade A hospital in the Wuhan area as the target population, the research subjects were determined by using the method of stratified cluster sampling. In the first stage, the targets were divided into five layers according to the ward and department settings: internal medicine, surgery, obstetrics and gynecology, pediatrics, and others. In the second stage, following the principle of convenient investigation, a certain number of departments were randomly selected from each layer, and all the clinical nurses in these selected departments were the subjects of this study [5]. Inclusion Criteria: Nurses with at least one year of clinical nursing experience; hospital employees; possessing normal language comprehension without history of mental disorders; voluntarily participating in this survey. Exclusion Criteria: Nurses with less than one year of nursing experience; those with severe physical illnesses; individuals with mental disorders or cognitive impairments; clinical nurses not voluntarily participating in this study.

### 2.2. Instruments

The survey questionnaire consists of three sections: a general information form, the Clinical Nurse Evidence-Based Core Competencies Survey developed by Wang *et al.* [6], and the Chinese version of the Evidence-Based Nursing Practice Barriers

Scale [7]. 1) General Information Form: It includes the clinical nurse's department, age, gender, years of experience, professional title, position, educational background, and whether pursuing a degree. 2) Evidence-Based Nursing Practice Core Competency Questionnaire for Nursing Staff: This section comprises four dimensions—evidence-based knowledge, evidence-based skills, evidence-based attitudes, and evidence-based behaviors—totaling 64 items. Each item is scored on a scale of 0 to 5 points, yielding a total score range of 0 to 320 points. Higher scores indicate stronger competency within that dimension. The total evidence-based competency score and each dimension's score are converted to a percentage scale. Scores  $\leq 25$ , 26 - 50, 51 - 75, and  $>75$  are classified into four levels: very poor, slightly poor, adequate, and good. The Cronbach's  $\alpha$  coefficient for the entire scale was 0.928, with subscale coefficients of 0.927, 0.849, 0.701, and 0.712, respectively. All items showed significant correlations with their respective subscale totals ( $P < 0.01$ ). 3) Chinese Evidence-Based Nursing Practice Barriers Scale: This 30-item scale comprises four dimensions—accessibility of research findings, quality of research reporting, resource conditions for implementing evidence-based nursing, and nurses' understanding of evidence-based nursing. Each item is scored 0 - 5 points, yielding a total range of 0 - 150 points. Higher scores indicate stronger association with the factor and poorer quality. The total scale score and scores across the four dimensions were converted to a percentage scale. Scores were categorized into four levels:  $>75$  points (severe impact), 51 - 75 points (moderate impact), 26 - 50 points (mild impact), and  $\leq 25$  points (minimal impact). The Cronbach's  $\alpha$  coefficient for the entire scale was 0.919, with dimension-specific coefficients of 0.825, 0.794, 0.815, and 0.729, respectively. All items showed significant correlations with their respective dimension totals ( $P < 0.01$ ).

### 2.3. Methods

The survey team comprised mentors, nursing instructors, nursing administrators, and master's degree candidates in nursing. Prior to the survey, investigators underwent standardized training and were deployed to clinical settings upon certification. Surveys were conducted one-on-one. Before distributing questionnaires, participants were briefed on the study's objectives, significance, and completion guidelines, while also being assured of the survey's anonymity and confidentiality. Respondents completed the questionnaires independently, with completion typically taking approximately 15 minutes. Completed questionnaires were collected immediately upon completion.

A total of 120 questionnaires were distributed, with 120 returned, achieving a 100% response rate.

### 2.4. Data Analysis

Data were analyzed using the SPSS 21.0 statistical software package. Descriptive statistics, univariate correlation analysis, and multiple linear regression analysis were performed. The significance level was set at  $\alpha = 0.05$ .

### 3. Results

#### 3.1. General Characteristics of Study Participants

The clinical nurses surveyed ranged in age from 19 to 54 years, with a mean age of  $(31.46 \pm 7.37)$  years. Their years of service ranged from 1 to 42 years, with a mean of  $(11.18 \pm 8.60)$  years. Internal medicine: 50 (41.7%); Surgery: 34 (28.3%); Obstetrics and Gynecology: 3 (2.5%); Pediatrics: 7 (5.8%); Other departments: 26 (21.7%); Female: 116 (96.7%); Male: 4 (3.3%); 45 nurses (37.5%), 47 registered nurses (39.2%), 25 senior registered nurses (20.8%), 3 deputy chief nurses or above (2.5%); 112 general nurses (93.3%), 8 ward head nurses (6.7%); current educational levels: 35 secondary vocational school graduates (29.2%), 44 with associate degrees (36.7%), and 41 with bachelor's degrees or higher (34.2%); 6 pursuing master's degrees (5%), 20 pursuing bachelor's degrees (16.7%), 6 pursuing associate degrees (5%), 2 pursuing other types of degrees (1.6%), and 86 not pursuing any degree (71.7%).

#### 3.2. Current Status of Evidence-Based Nursing Competency among Clinical Nurses

The total score for the Evidence-Based Nursing Competency Scale among clinical nurses was  $(135.92 \pm 41.04)$  points, which converts to a percentage score of  $(42.48 \pm 12.83)$ , indicating a slightly inadequate level. Among the four dimensions, Evidence-Based Knowledge and Evidence-Based Practice scored the lowest, as shown in **Table 1**.

**Table 1.** Scores for evidence-based nursing competencies and their four dimensions among clinical nurses (n = 120).

Project	Actual Score ( $\bar{x} \pm s$ )	Percentage Score Grade [n (100%)]			
		>75 (Good)	50 - 75 (Passing)	26 - 51 (Fair)	≤26 (Poor)
Total Score	135.9 ± 41.04	3 (2.5)	29 (24.2)	84 (70)	4 (3.3)
Evidence-Based Knowledge	64.17 ± 29.47	3 (2.5)	16 (13.3)	50 (41.7)	51 (42.5)
Evidence-Based Skills	14.52 ± 6.07	11 (9.2)	47 (39.2)	48 (40)	44 (11.7)
Evidence-Based Attitude	41.24 ± 4.56	98 (81.67)	17 (14.17)	3 (2.5)	2 (1.67)
Evidence-Based Behavior	15.99 ± 8.37	6 (0.05)	29 (24.17)	40 (33.33)	45 (37.5)

#### 3.3. Current Status of Barriers to Evidence-Based Practice among Clinical Nurses

**Table 2.** Barriers to evidence-based practice among clinical nurses and their scores across four dimensions (n = 120).

Project	Actual Score ( $\bar{x} \pm s$ )	Percentage Score Grade [n (100%)]			
		>75 (Severe Impact)	50 - 75 (Moderate Impact)	26 - 51 (Mild Impact)	≤26 (Minimal Impact)
Total Score	87.0 ± 20.89	11 (9.2)	73 (60.8)	30 (25)	6 (5)
Availability of Research Findings	22.5 ± 7.1	21 (17.5)	53 (44.2)	38 (31.7)	8 (6.7)
Quality of Research Reporting	18.8 ± 4.68	5 (4.17)	50 (41.67)	58 (48.3)	7 (5.8)

**Continued**

Resource Conditions for Implementing Evidence-Based Nursing	28.20 ± 7.25	26 (21.7)	70 (58.3)	22 (18.3)	2 (1.7)
Nurses' Awareness of Evidence-Based Nursing	17.46 ± 6.21	8 (6.7)	52 (43.3)	49 (40.8)	11 (9.2)

The total score on the Barriers to Evidence-Based Practice Scale for Clinical Nurses was ( $87.04 \pm 20.89$ ), which converts to a percentage score of ( $58.03 \pm 13.93$ ), indicating a moderate level of impact. Among the four dimensions, the availability of research findings and the resource conditions for implementing evidence-based nursing practice had the most significant impact, as shown in **Table 2**.

### 3.4. Univariate Correlation Analysis of Evidence-Based Competency among Clinical Nurses

Using the total evidence-based competency score as the dependent variable, univariate correlation analysis was conducted with the following independent variables: department, age, years of service, professional title, position, current educational level, degree being pursued, and evidence-based nursing practice barriers score. Results indicate that clinical nurses with higher professional titles and educational levels demonstrate superior evidence-based competency, while those with higher evidence-based nursing practice barriers scores exhibit poorer competency. See **Table 3**.

**Table 3.** Univariate correlation analysis of evidence-based competencies among clinical nurses.

Independent Variables	r	P
Department	0.170	0.063
Age	0.092	0.320
Years of Experience	-0.020	0.829
Professional Title	0.202	0.027
Position	0.151	0.099
Education Level	0.193	0.035
Degree Pursued	0.088	0.339
Evidence-Based Practice Barriers Score	-0.332	0.000

Note:  $P < 0.05$ .

### 3.5. Multiple Regression Analysis of Evidence-Based Competency among Clinical Nurses

Using the total actual score for evidence-based competency as the dependent variable, and department, age, years of service, professional title, position, current educational level, and evidence-based nursing competency scores as independent variables, a multiple linear regression analysis was conducted. Among the observed

values set are the partial regression coefficient, the standard error, and the standard regression coefficient. The independent variable assignment table is shown in **Table 4**. Results indicated:  $r = 0.453$ ,  $r^2 = 0.205$ ,  $F = 9.973$ ,  $P = 0.000$ . Nurses with higher professional titles and educational levels, along with lower scores on barriers to evidence-based practice, demonstrated superior evidence-based competency (see **Table 5**).

**Table 4.** Independent variable assignment table.

Independent Variables	Assignment Method
Age	19 - 25 = 1; 26 - 32 = 2; 33 - 39 = 3; 40 - 46 = 4; $\geq 47 = 5$
Gender	Male = 0; Female = 1
Years of Work Experience	1 - 8 = 1; 9 - 16 = 2; 17 - 25 = 3; 26 - 33 = 4; $\geq 34 = 5$
Professional Title	Nurse = 1; Registered Nurse = 2; Senior Registered Nurse = 3; Deputy Chief Nurse and above = 4
Position	Nurse = 1; Ward Nurse Manager = 2; Department Nurse Manager = 3; Director of Nursing = 4
Education Level	Vocational School = 1; College = 2; Bachelor's Degree = 3; Master's Degree and Above = 4

**Table 5.** Multiple regression analysis of evidence-based competencies among clinical nurses.

Influencing Factors	$b$	$S \times b$	$b'$	$t$	$P$
Constant Term	144.374	19.556		7.382	0.000
Professional Title	10.344	4.139	0.207	2.499	0.014
Educational Background	10.801	4.093	0.222	2.639	0.009
Evidence-Based Practice Barriers	-0.578	0.165	-0.294	-3.511	0.001

Note:  $P < 0.05$ .

#### 4. Discussion

The evidence-based competency of clinical nurses requires improvement. 84% of the clinical nurses scored in the slightly poor range for the original total score of their evidence-based qualities, while 4% scored in the very poor range, indicating they lack fundamental evidence-based competencies. In univariate analysis, clinical nurses with higher professional titles demonstrated higher evidence-based competency, likely due to their stronger foundational skills and greater initiative in learning. 50% of clinical nurses scored at the slightly inadequate level for evidence-based knowledge, while 51% scored very poor, particularly lacking knowledge in medical English and research statistics. This aligns with findings from Wang *et al.* [8]. However, 98% of clinical nurses expressed positive attitudes toward evidence-based nursing and willingness to implement it in clinical practice, consistent with results

from Zhu *et al.* [9]. Given these circumstances, hospitals should actively foster evidence-based culture and provide nursing staff with simple, effective evidence-based resources. Research by Bowles *et al.* [10] indicates that increasing learning opportunities for nursing staff, fostering evidence-based culture, and providing simple, effective evidence-based resources can promote evidence-based nursing practice. Clinical settings should offer tailored training programs for nurses at different levels, including lectures on evidence-based practice knowledge, book reports, literature search courses, nursing English, and evidence-based practice case studies. Integrating specialized training with foundational education can best meet the evidence-based knowledge needs of nursing staff across all levels [11].

The impact of barriers to evidence-based nursing on evidence-based nursing competency is negatively correlated. The higher a nurse's score on barriers to evidence-based practice, the lower their competency score. 11% of the clinical nurses had a moderate impact score for the original total of their barriers in evidence-based nursing practice, and 73% had a severe impact score, indicating the presence of obstacles in evidence-based nursing practice, indicating significant obstacles in evidence-based nursing practice. The top three barriers to implementing evidence-based nursing practice are: lack of sufficient time at work to explore new ideas, insufficient time to read research publications, and the uncertainty of whether research findings can be implemented in nursing practice. These factors fall under the third dimension (resource conditions for implementing evidence-based nursing). The comprehensive implementation and evaluation of evidence-based nursing require significant time and effort from nursing staff. However, the reality in most Chinese hospitals is a severe shortage of nursing personnel [12]. Clinical nurses operate under excessive workloads. Expecting them to identify problems amidst busy clinical duties and dedicate substantial time to researching optimal solutions is undeniably challenging. Given these circumstances, hospital leadership and management must prioritize evidence-based nursing, actively fostering a supportive environment. Hospitals should provide healthcare staff with the following essential conditions: 1) Effective policy support; 2) High-speed network systems and high-performance computers; 3) Multi-tiered electronic resources for evidence-based medicine; to facilitate evidence-based nursing practice [13]. Additionally, nursing administrators must enhance human resource management, improve logistical support, reduce nurses' workload, and rationally allocate personnel. They should also implement tiered management to ensure nurses proficient in evidence-based nursing have sufficient time to complete evidence-based tasks [14].

## 5. Conclusion

In summary, the evidence-based nursing competencies of clinical nursing staff in this study were generally low. However, the vast majority of nursing personnel demonstrated a positive attitude toward learning evidence-based nursing knowledge and exhibited a strong willingness to learn. Nursing administrators should provide support at all levels and actively promote evidence-based nursing practices. A blended

approach combining elite training with tiered education, self-directed learning with external training, can be implemented to deliver evidence-based nursing education in clinical settings. Efforts should also focus on establishing a faculty team for evidence-based nursing education. This model aims to disseminate evidence-based concepts and skill development through targeted initiatives, ultimately enhancing the evidence-based nursing competencies of clinical nurses.

## 6. Limitations of the Study

This study only investigated the evidence-based competencies of clinical nurses at a tertiary-level hospital in Wuhan region, and did not investigate other regions, sub-hospitals, and other health care providers due to the limitation of human and material resources, suggesting that future studies could investigate other health care institutions such as nursing homes and community health centers.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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