

# Critical Thinking Competence Application and Analysis Issues among Nurses to Facilitate Patient Care

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## Abstract

**Background:** Critical thinking requires distinguishing between statements of truth, judgment, and opinion. Critical thinking demands the nurse to plan ahead, apply thought while acting, and reflect in retrospect, which is known as reflective thinking. Creativity in problem-solving and decision-making is the capacity to create and implement novel and superior healthcare solutions. **Objectives:** To assess the knowledge of nurses related to application and analysis concepts (pre-test). To evaluate nurses' knowledge related to application and analysis concepts (post-test). **Method:** Between 10th October 2020 and 30th August 2022, a quantitative study utilizing a pre-test and post-test methodology and a quasi-experimental design was done to examine the impact of a critical thinking educational program on the knowledge of nurses. A non-probability purposive sample was chosen for this study's sample according to the crucial role of nurses in the critical care units in Al-Hillah Teaching Hospitals. **Results:** The present study confirmed the study's findings including the majority of nurses of both groups were in middle adulthood, between (25-29) The majority of the participants in the interventional and control group, (77.8%), (66.7%) were female nurses, (50%) of the control group were married and (63.9%) from the interventional group were single. Related to years of experience the results show that the high percentage in both groups 32 (88.9%), and 24(66.7) were with 3 years or less. **Conclusion:** The majority of participants in the study exhibited similar demographical (age, gender, marital status) and occupational characteristics (years of experience for nurses). The knowledge of the nurses who participated in the critical thinking educational program increased following its implementation compared to their total pre-intervention evaluation. **Recommendations:** Enhance nurses' knowledge and skills using self-learning packages and online-learning courses. Conduct longitudinal research designs that will enable future researchers to track nurses' critical thinking developed over the course of their entire undergraduate careers.

**Keywords:** Analysis, Issues, Nurses, Patient Care

## 1. Introduction

Critical thinking requires distinguishing between statements of truth, judgment, and opinion. Critical thinking demands the nurse to plan ahead, apply thought while acting, and reflect in retrospect, which is known as reflective thinking. Creativity in problem-solving and decision-making is the capacity to create and implement novel and superior healthcare solutions. (Alfaro-LeFevre, R., 2017). Problem-solving ability is a nursing care provider's proficiency in quickly and accurately mediating the health problems a patient faces, even if it is the nursing care provider's first patient. Moreover, problem-solving ability has been cited as a significant performance element in nursing (Kim and Sohn 2019). Critical thinking is a requirement in every enterprise in the globe. A skill is becoming more of a must-have than a should-have or must-have. Critical thinking abilities are necessary for leaders, managers, directors, supervisors, employees, and students, it must be a practical ability (Jones, A., 2019). Since nurses operate in a variety of jobs and situations that are either directly or indirectly related to patient care, and critical thinking has garnered particular focus for

quality improvement, In addition to the necessity for patient-centered care and evidence-based practice (Mahmoud et al, 2017).

The application of life skills in the Prophet's Sunnah is based on the life skills recommended by WHO, such as problem-solving, decision-making, creative thinking, critical thinking, self-awareness, empathy, interpersonal relationship, effective communication, stress management, and emotion management (Abdullah, et al., 2021).

Decision-making refers to the cognitive process of systematically recognizing options, analyzing those choices, reaching a decision, and choosing an option. Before deciding on a course of action, Baron explained, decision-making requires considering the prospective costs and rewards of each alternative (Baron, J., 2000). Making Clinical Decisions. It is a part of critical thinking development that involves identifying, prioritizing, and continuously evaluating complex, rapidly changing patient problems and solutions. It is a process used by healthcare professionals to recognize a problem, collect information about the problem, develop a plan to

address the problem, and implement the plan at the appropriate time (Goldberg, 2015).

## Objectives

To assess the knowledge of nurses related to application and analysis concepts (pre-test). To evaluate nurses' knowledge related to application and analysis concepts (post-test).

## 2. Method

### Study Design

Between 10th October 2020 and 30th August 2022, a quantitative study utilizing a pre-test and post-test methodology and a quasi-experimental design was done to examine the impact of a critical thinking educational program on the knowledge of nurses.

### Setting of the Study

The study was conducted in Al-Hillah City. The data were collected from Al-Hillah Teaching Hospitals, critical care departments involve: (emergency departments, intensive care units, coronary care units, postoperative units' surgical units", and medical units) in the following Hospitals:

1. Morjan Medical City: which included (12) nurses participating in a pilot study, is a hospital located in the city of Hilla in Babil Governorate, Iraq. It is a public educational medical institution that includes many specialized centers, which provide free services to the citizens of the governorate and neighboring areas.
2. Al-Emam Al-Sadiq Teaching Hospital: (36) nurses engaging in an interventional group; one of the Governmental Hospitals of Babylon Governorate. The hospital is linked with the Ministry of Health in Iraq. The hospital has 492 inpatient beds, numerous clinics and specialty units, and 18 operating rooms. The hospital's director is Adel Ibrahim Al-Najjar. In 2017, the hospital opened.
3. Al-Hilla teaching hospital, Critical Care Units included (36) nurses participating in a control group, The increase in population and a large number of disease cases that the pets are exposed to every year, they are accustomed to suffering from deadly diseases that kill hundreds of the poor who do not have the means to feed their lives, which prompted the need to build a hospital inside the city of Hilla to accommodate all medical specialties, so opened Al-Jumhuri Hospital 1972 A.D. Hilla Hospital (Al-Asadi, Salah Hashem Zghair, & Hassan Hadi Hassan., 2018).

### The Sample of the Study

A non-probability purposive sample was chosen for this study's sample according to the crucial role of nurses in the critical care units in Al-Hillah Teaching Hospitals.

### Step One: Preliminary Assessment Need of Nurses' Knowledge about Critical Thinking

Data were collected from (10) nurses who work in critical care units at Al-Emam Alsadiq Teaching

Hospital. The preliminary study included (10) close-ended questions (Appendix: 4) based on related literature. These close-ended questions were administered to know nurses' knowledge about critical thinking and help construct the program and the questionnaire. The assessment need was applied from the period between 10<sup>th</sup> to 25<sup>th</sup> August 2021.

### Step Two: Construction of Educational Program

It comprised of (4) sessions that focus to achieve the following objectives: -

1. Improving the quality of critical thinking for nurses.
2. Applying interpretation and analysis by nurses in different situations.
3. Find out suitable decisions and the best solutions for critical issues.

The program was created from 3<sup>rd</sup> September 2021 to 5<sup>th</sup> December 2021 (Appendix: 5).

### Step Three: Study Tools

The researcher prepared a special questionnaire form; it was composed of four main parts:

Part I: Nurses' agreements: This part includes a cover letter to obtain the nurses' agreements (written consent) to participate in this study.

Part II: Demographical characteristics: This part involves basic information about the demographic of nurses' characteristics (age, gender, marital status).

Part III: Employment characteristics: (hospital name, years of experience as a nurse, units that nurse worked in.

### Part 5: Nurses' Knowledge Related to Critical Thinking

#### Concepts ; which Included two Domains

The multiple-choice questions about nurses' Knowledge related to critical thinking concepts were used in this part:

first domain is the application in this domain (6) items.

Second domain analysis which consists of (7) items.

## 3. Result

### Rating and Scoring

All items were constructed by using MCQs with one correct answer. In addition, the questionnaire is designed using (2) level type Likert Scale (right and wrong) to assess nurses' knowledge about critical thinking. The scoring system of the scale consists of (2) types of scores; (2) for the correct answer and (1) for incorrect answer. So that the cutoff point calculated to determine the level of knowledge is presented as the following: (1-1.49) = poor; (1.5-2) good. Cut-off points for nurses' scores for total knowledge: poor = (45-67), Good = (68-90).

Items	Rating and intervals	Control group		Interventional Group		p.value
		Frequency	Percent	Frequency	Percent	
Age / Years	20-24	15	41.7	9	25.0	.239 N. S
	25-29	20	55.6	24	66.7	
	30-34	1	2.8	3	8.3	
	Total	36	100.0	36	100.0	
	Mean ±SD	1.61±.549		1.83±.561		
Gender	Male	8	22.2	12	33.3	.014 N. S
	Female	28	77.8	24	66.7	
	Total	36	100.0	36	100.0	
Marital Status	Single	18	50.0	23	63.9	.234 N. S
	Married	18	50.0	13	36.1	
	Separated	0	0	0	0	
	Divorced	0	0	0	0	
	Widow	0	0	0	0	
	Total	36	100.0	36	100.0	
Years of experience	3or less	32	88.9	24	66.7	.036 S
	4-6	3	8.3	9	25.0	
	7-9	1	2.8	3	8.3	
	Total	36	100.0	36	100.0	
	Total	36	100.0	36	100.0	

No	Items	Control			Interventional		
		Pre-test	Post-test	p-value	Pre-test	Post-test	p-value
		Mean $\pm$ SD	Mean $\pm$ SD		Mean $\pm$ SD	Mean $\pm$ SD	
1	Which of the following best demonstrates a nurse's use of self-reflection to improve clinical decision-making?	1.19 $\pm$ .401	1.19 $\pm$ .401	.091	1.39 $\pm$ .494	1.42 $\pm$ .500	0.667
2	The patient does not appear to be in trouble, but the assistive staff has detected an exceedingly low pulse. The nurse next auscultates the patient's apical pulse and inquiries about any complaints or previous cardiac problems. Which critical thinking skill is the nurse utilizing?	1.14 $\pm$ .351	1.14 $\pm$ .351		1.03 $\pm$ .167	1.58 $\pm$ .500	
3	What will be helpful to manage medical unit team members during stressful situations, when everyone feels pressured and gets into more arguments:	1.22 $\pm$ .422	1.19 $\pm$ .401		1.28 $\pm$ .454	1.61 $\pm$ .494	
4	By using known criteria to conduct an assessment, such as reviewing the typical characteristics of pain with the patient, a nurse demonstrates which critical thinking attitude?	1.19 $\pm$ .401	1.19 $\pm$ .401		1.31 $\pm$ .467	1.69 $\pm$ .467	
5	The surgical unit has begun the use of a pain rating scale to determine the degree of postoperative pain in patients. The registered nurse (RN) examines the pain flow sheet to view the pain scores reported for a patient throughout the previous twenty-four hours. The application of the pain scale exemplifies which intellectual standard?	1.25 $\pm$ .439	1.22 $\pm$ .422		1.39 $\pm$ .494	1.47 $\pm$ .506	
6	During a home health visit, the nurse prepares to train an injured shoulder patient in range-of-motion (ROM) exercises. The nurse verifies that the patient took an analgesic thirty minutes before to their arrival at their residence. The nurse instructs the patient to complete the exercises after outlining their purpose and demonstrating each one. After two efforts with only the second of three exercises, the patient replies, "That's enough." "These hurt excessively. I do not see why I must do this so many times." Which of the following actions demonstrates the nurse's application of the integrity-based critical thinking attitude?	1.44 $\pm$ .504	1.50 $\pm$ .507		1.64 $\pm$ .487	1.69 $\pm$ .467	
General mean and SD		1.238 $\pm$ 0.419	1.238 $\pm$ 0.413		1.34 $\pm$ 0.427	1.576 $\pm$ 0.489	
Evaluation		Poor	Poor		Poor	Good	
N		36	36		36	36	

Overall assessment	Pre test				Post-test			
	freq	%	Mean	Assessment	freq	%	Mean	Assessment
Poor	12	92.31%	1.259	Poor	2	13.4%	1.613	Good
Good	1	7.69%			11	84.6%		

Table 5: Evaluation of Responses of The Interventional and Control Groups Regarding the Analysis

Domain							
No	Items	Control		p-value	Interventional		p-value
		Pre-test	Post-test		Pre-test	Post-test	
		Mean $\pm$ SD	Mean $\pm$ SD		Mean $\pm$ SD	Mean $\pm$ SD	
1	Which of these patient scenarios is most indicative of critical thinking?	1.39 $\pm$ .494	1.42 $\pm$ .500	0.288	1.56 $\pm$ .504	1.69 $\pm$ .467	0.332
2	A nurse has recently begun working at a well-baby clinic. Helping a mother learn the steps of breastfeeding was one of her recent experiences. During the mother's first visit to the clinic, she had difficulty positioning the infant for feeding. The nurse considers factors such as the mother's obesity and lack of experience that contributed to her inability to breastfeed. The nurse's evaluation of the situation is referred to as the nurse's assessment of the situation.	1.36 $\pm$ .487	1.33 $\pm$ .478		1.19 $\pm$ .401	1.53 $\pm$ .506	
3	A nurse enters the home of a 72-year-old patient and begins to monitor her behavior and assess her physical health. The nurse observes bruising on the patient's leg and discovers that the patient lives alone. Upon observing the patient's movement, the nurse observes that she walks unsteadily and leans to one side. The patient acknowledges falling in the past. The nurse identifies the patient as having a Risk for Falls nursing diagnostic. This situation is an illustration of:	1.14 $\pm$ .351	1.17 $\pm$ .378		1.22 $\pm$ .422	1.67 $\pm$ .478	
4	A patient on the surgical unit experiences a dramatic decrease in blood pressure and shortness of breath. The team replies, but thirty minutes later the patient dies. The manager of the nursing unit assembles the personnel participating in emergency response. The staff analyzes what transpired during the 30-minute interval, the actions done, and whether additional measures should have been taken. The nurses involved in this scenario are:	1.14 $\pm$ .351	1.17 $\pm$ .378		1.08 $\pm$ .280	1.61 $\pm$ .494	
5	In a patient with I.V. fluid, the rate flow is noted as correct, because of the cannula, the nurse assesses the site of the cannula, and repositions the patient arm so the infusion continues to flow easily. This is a type of:	1.31 $\pm$ .467	1.28 $\pm$ .454		1.22 $\pm$ .422	1.67 $\pm$ .478	
6	Three years have been spent by a nurse in an oncology unit. One patient has gotten visibly weaker and is feeling "weird." The nurse is familiar with the fact that cancer patients frequently exhibit altered behavior before to acquiring sepsis. The nurse observes the patient shivering while assessing the patient's cognitive abilities through a series of questions. The nurse dials the doctor's number and begins the discussion by saying, "Hello, doctor." "I feel that your patient is exhibiting symptoms of sepsis. I wish to disclose symptoms I'm observing." What examples of topics related to critical thinking does the nurse provide? Check the boxes that apply.	1.17 $\pm$ .378	1.17 $\pm$ .378		1.22 $\pm$ .422	1.58 $\pm$ .500	
7	16 hours ago, a patient underwent hip surgery. The patient's postoperative drainage collection device contained 40 mL of drainage for 8 hours during the previous shift. The nurse refers to the documented plan of care, stressing that the health care provider must be alerted if the device's daily drainage reaches 100 mL. As soon as the nurse enters the room, she examines the drainage device and takes meticulous note of its current volume. As an illustration:	1.44 $\pm$ .504	1.42 $\pm$ .500		1.39 $\pm$ .494	1.81 $\pm$ .401	
General mean and SD		1.278 $\pm$ 0.433	1.28 $\pm$ 0.438		1.268 $\pm$ 0.420	1.651 $\pm$ 0.474	
Evaluation		Poor	Poor		Poor	Good	
N		36	36		36	36	

#### 4. Discussion

This study finds out the critical thinking impact on the knowledge of nurses. The results are discussed in the following parts:

##### Part I: Demographic in addition to Employment Characteristics of the Study Sample for both Interventional and Control groups

This study began by attempting to identify the participants, as well as their demographic and job characteristics. Seventy-two nurses were divided into

two groups: interventional and control. The present study confirmed the study's findings including the majority of nurses of both groups were in middle adulthood, between (25-29). The majority of the participants in the interventional and control group, (77.8%), (66.7%) were female nurses, (50%) of the control group were married and (63.9%) from the interventional group were single. Related to years of experience the results show that the high percentage in both groups 32 (88.9%), and 24 (66.7%) were with 3 years or less.

According to Heidari and Shahbazi (2016) conducted a study titled "Effect of training problem-solving skill on decision-making and critical thinking of personnel



during medical emergencies" and reported that all of the participants were male nurses between the ages of 23 and 51 with between one and twenty-nine years of work experience.

## Part II: Discussion of nurses' Knowledge related to critical thinking concepts

The consideration of knowledge is an essential component of critical decisions and is a key component of the quality of clinical decision-making. When comparing the pre-test and post-test of the study sample (interventional and control), the findings show that the pre-test recorded low a level, while post-test recorded significant change for the interventional group which indicated strongly the effectiveness of the educational program content which presented for participants during the data collection period. The pre-test and post-test scores were compared immediately after implementing the educational program.

These findings show the strong relationship between basic knowledge as the first step in Bloom's Taxonomy and their ongoing process of understanding, decision-making, and analysis which prepare the nurses to face any situation during their daily care.

### Interventional and Control Groups Responses for the Application Domain

The application of critical thinking skills within the nursing process provides a decision-making framework for the development and guidance of a plan of care for the patient that incorporates notions of evidence-based practice (Toney-Butler, et al., 2018).

The current study depicts the statistical analysis related to the application domain and shows that the general mean ( $1.23 \pm 0.41$ ) at the pre-test for the control group recorded poor knowledge of all studied items, as well as the study result at the post-test recorded poor knowledge at all studied items except item number 6. while the finding demonstrates the assessment of the study sample responses at the pre-test for interventional group related application domain. The study results indicate that the intervention group at the pre-test is poor at all studied items, as well as, the study results indicate that the intervention group at the post-test is good at all studied items except, item number 5.

In general, scores between post-test after the educational intervention; the mean of the score for the pre-test was ( $1.34 \pm 0.427$ ), in post-test was ( $1.576 \pm 0.489$ ) indicating, that to match the outcomes of the pre-test and post-test (directly following the educational intervention), table (4-5).

This result was consistent with the findings of Farmer et al., who conducted a study titled Questioning Aid for Rich, Real-Time Discussion (QARRD): A Tool to Improve Critical Thinking in Clinical Settings and found that the majority (71%) of pre-workshop prompts emphasized lower-order thinking skills (remembering/understanding). The intricacy of the

participants' discussion suggestions grew dramatically after the training. Sixty-nine percent of post-workshop prompts demonstrated higher-order cognitive abilities (apply/analyze/evaluate/create). Sutriyanti, et al (2019). A study was conducted to assess, diagnose, intervene, implement, and evaluate nursing care using the critical thinking model of registered nurses. Identical pre- and post-test designs were applied to the control group using the same study methodology. Five days of training focused on the application of knowledge and critical thinking models to the implementation of nursing care for patients. Thirty nurses who administer directed care to surgery patients comprised the sample. A dependent test and multiple linear regression were utilized to examine the data. The results indicated that there was a significant difference between the nurses' knowledge before and after training ( $p$ -value = 0.001), whereas there was a significant difference between the nurses' application and critical thinking ability when caring for patients before and after training ( $p$ -value = 0.000). ( $p$ -value 0.004). Diagnosis, nursing intervention, and assessment were shown to differ marginally. The critical thinking skills of nurses who receive training can improve by 14.95 points. Nursing care for post-operative patients can be enhanced by the implementation of models of critical thinking skills.

The study also revealed a significant correlation ( $p=0.003$ ) between nurses' critical thinking and the deployment of documentation of integrated patient development records. The usage of integrated documentation records by nurses is evidence that they are able to think critically, comprehend their responsibilities, and carry them out during the implementation of care. Compared to nurses who lack critical thinking, nurses who can consistently think critically can generate important insights and serve as the foundation for logical thought (Deniati et al., 2018).

As a result, nursing practices necessitate the use of reasoning, mental habits, and emotional factors that entail interpersonal relationships and the necessity to make quick clinical judgments that affect the quality of care offered.

### Interventional and Control Groups Responses for Analysis Domain

Concerning nurses' understanding of analysis skills, the present study indicated a highly statistically significant improvement in problem-solving through practice as a result of increased analysis skills.

In a complex interaction between critical thinking and the present health system, the competencies of 21st-century nurses provide effective and safe care. Concept related to critical thinking is problem-solving, which is required for clinical decision-making processes in nursing and relates to critical thinking (Hung, Tang & Ko 2015).

The study found statistically significant changes in the analysis domain in the interventional group

based on their nurses' knowledge of the post-test and pre-test, table (4-6). Meanwhile, no significant variations between the post-test and pre-test in the control group's analysis domain based on nurses' knowledge.

The statistical analysis related to the analysis domain shows that the general mean ( $1.27 \pm 0.43$ ) at the pre-test and post-test for the control group recorded poor knowledge of all studied items. while the Findings demonstrated assessment of the study sample responses at the pre-test for the intervention group-related analysis domain. The study results indicate that the intervention group at the pre-test are poor at all studied items except, the item number (1) the responses were good knowledge, as well as, the study results indicate that the intervention group at the post-test is good at all studied items.

These results were comparable to those of Altas, G. (2020). The Relationship between Critical Thinking Attitude and Problem-Solving Skills in Nurses was the topic of a study. According to the results, the total mean score for Critical Thinking Disposition nurses was determined to be 195.7725.70, while the total mean score for problem-solving skills was 111.7616.52. It was established that there was a moderately significant correlation ( $r=0.414$ ,  $p 0.05$ ) between the critical thinking disposition and problem-solving skills of nurses.

From this point of view, the nursing process considers a problem-solving approach that allows the nurses to identify the client's needs according to data analysis, putting a plan and intervention need judgment and decision-making this kind of performance needs a critical thinking process to provide the clients with proper care which produce a positive outcome and client's satisfaction.

## 5. Conclusions

The majority of participants in the study exhibited similar demographical (age, gender, marital status) and occupational characteristics (years of experience for nurses). The knowledge of the nurses who participated in the critical thinking educational program increased following its implementation compared to their total pre-intervention evaluation. As compared to their pre-implementation evaluation, the nurses' understanding of application and analysis domains increased after the program was implemented.

## Recommendations

- Enhance nurses' knowledge and skills using self-learning packages and online-learning courses.
- Conduct longitudinal research designs that will enable future researchers to track nurses' critical thinking developed over the course of their entire undergraduate careers.
- Examining a wider variety of antecedents of critical thinking; including concept mapping and problem-based learning.

- Investigating the effectiveness of using self-learning packages in teaching different nursing administration concepts.
- Nurses' knowledge, behavior, confidence, and educational needs for the care of patients in all situations were acceptable and could be improved by including them in specialized programs The nurses must be encouraged to engage in seminars and continuing education.
- The creation of clinical guidelines and participation in continuing education conferences are recommended for enhancing nurses' ability to think critically.
- Examine nursing programs to discover illustrative applications of instructional strategies that foster the development of metacognitive capacities and skills in nursing students. The investigation could then be expanded to study the employment orientation procedure and particular metacognition-promoting tactics.
- To operate well in practice, nurses must reflect on how they learn, be skilled thinkers, and know when to recall and use previously taught information or skills for good decision-making in clinical circumstances.

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