

## Clinical Decision Making of Greek Nurses Working in Health Centers, Emergency Rooms, Medical-Surgical Clinics and ICUs

Demitzoglou Michael<sup>1</sup>, Bakalis Nikolaos<sup>2\*</sup>, Michalopoulos Antigone<sup>3</sup>, Tzenalis Anastasios<sup>4</sup>, Kiekkas Panagiotis<sup>2</sup>, Kotsela Georgia<sup>5</sup>, Drakopanagiotaki Aikaterini<sup>5</sup>, Filiotis Nikolaos<sup>6</sup>

<sup>1</sup>Nurse, University of Patras, Greece

<sup>2</sup>Associate Professor, Department of Nursing, University of Patras, Greece

<sup>3</sup>Laboratory Teaching Staff Member, Department of Nursing, University of Patras, Greece

<sup>4</sup>Assistant Professor, Department of Nursing, University of Patras, Greece

<sup>5</sup>General Hospital of Korinthos, Greece

<sup>6</sup>Professor, Department of Medicine and Surgical Sciences, University of Magna Graecia, Catanzaro, Italy

### \*Corresponding author:

Nick A. Bakalis,  
Associate Professor, Department of Nursing,  
University of Patras, Greece,  
Tel: +30-6938053217;  
E-mail: nikosbakalis@upatras.gr

Received: 12 Jun 2021

Accepted: 01 July 2021

Published: 07 July 2021

### Copyright:

©2021 Nikolaos B. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and build upon your work non-commercially.

### Citation:

Nikolaos B, Clinical Decision Making of Greek Nurses Working in Health Centers, Emergency Rooms, Medical-Surgical Clinics and ICUs. *Ann Clin Med Case Rep.* 2021; V6(19): 1-7

### Keywords:

Clinical decision making; Nurses; Greece

### Author Contributions:

Michael D, Nikolaos B, Antigone M, Anastasios T, Panagiotis K, Georgia K, Aikaterini D, Nikolaos F and these authors are contributed equally to this article

### 1. Abstract

Clinical decision making is an integral part of nursing science and daily clinical nursing practice.

**1.1. Aims:** To investigate and compare clinical decisions made by nurses working in Health Centers, Emergency Departments (ERs), Medical and Surgical Clinics and Intensive Care Units (ICU).

**1.2. Methods:** Clinical decision-making cards (Q methodology) and a questionnaire were developed to investigate factors that influence clinical decision-making.

**1.3. Results:** Nurses working in Health Centers made moderate clinical decisions for dyspnea and incomplete clinical decisions for CPR, while nurses working in ERs made good clinical decisions for MI and moderate for dyspnea. Also, nurses working in Medical Clinics made moderate clinical decisions for all scenarios (CPR, MI, dyspnea, vomiting). Finally, nurses working in Surgical Clinics made good clinical decisions for dyspnea and moderate for CPR, while nurses working in ICU made good clinical decisions for all scenarios.

**1.4. Conclusions:** Nurses working in ICU make better clinical decisions than nurses working in Health Centers, ERs, Medical and Surgical Clinics. This is possible due to the better staffing of the ICUs, the implementation of nursing protocols, the high degree of autonomy they have and the severity of the patients illness they face on a daily basis.

### 2. Introduction

#### 2.1. Clinical Decisions

The daily decisions that nurses make regarding hospitalization and the use of limited resources force them to think and act in cases where there are neither clear answers nor specific procedures (Stillman, 2018) and often making a decision becomes an even more complicated process (Papathanasiou, 2016). Effective clinical decision-making skills are a key factor in preventing medical errors (Nibbelink & Brewer, 2018). It is important for nurses to make sound clinical decisions because they improve the quality of the patient's health care, as it offers the greatest health benefits in the most effective and acceptable way (Marino, Andrews & Ward, 2020).

Decision-making is regarded as an essential component of the nursing role. Models of practice are essentially decision-making models and thus synonymous with accepted definitions of professional activity (Taner, 2006). Banning (2008) defined decision making as a process that nurses use to gather information about patients, evaluate it and make judgements that result in the provision of nursing care. Despite the extensive measurement of decision-making, most authors have defined the decision making process.

Some authors use the phrases problem solving, critical thinking, clinical reasoning, clinical judgement and decision making interchangeably (Román-Cereto et al 2018, Cui et al 2018), while others differentiate between decision making, clinical reasoning and problem solving (Johansen & O'Brien 2015, Finkelman, 2001). Khamseh et al (2019) states that problem solving involves a synthesis of new information derived from existing knowledge to identify solutions to problem situations. Critical thinking is defined by Sommers (2018) as a process and cognitive skill that nurses apply to identify and define problems as well as to reach conclusions. Therefore, critical thinking is an essential part of decision-making (Cui et al (2018) but not synonymous with problem solving. Rababa & Al-Rawashdeh (2021) point out that critical thinking may not conclude solutions to problems, but a greater understanding of the problem itself and a need to tolerate ambiguity. It seems that decision-making is not synonymous with problem solving but rather it is a tool to solve problems.

In addition, according to Merisier et al (2018) clinical reasoning is the process by which nurses collect cues, process information, come to an understanding of a patient's problem, plan and implement interventions, evaluate outcomes, and reflect on the process. Clinical reasoning differs from decision making, in that it specifically focuses on the thinking strategies used to make a judgment or decision and solve problems (Johansen & O'Brien 2015). On the other hand, Al Sabei and Lasater (2016) point out that clinical judgment is an interpretation or conclusion about a patient's needs, concerns, or health problems as well as to decide on when to take (or not take) action, modify standard approaches and improvise as deemed necessary according to the patient's response. Manetti (2019) revealed that clinical judgment is an ambiguous term synonymous to decision-making and results from critical thinking and clinical reasoning.

The fields of cognitive psychology and management science have produced numerous and often conflicting theories of decision-making. From a stated common purpose to explain and predict the processes that govern human decisions, these theories make various assumptions about the nature of knowledge and generation of information. There are two basic models of nursing decision-making: a) the information-processing model, in which decisions are made according to protocols and algorithms and b) the intuitive-humanist model, where decisions are made according to experience and knowledge (Banning, 2007).

<http://acmcasereports.com/>

## 2.2. Influencing Factors of Clinical Decision Making

Research has shown that nurses' clinical decisions are mainly influenced by years of experience (Kydonaki et al 2016, Nibblelink & Brewer 2018), critical thinking (Ludin, 2018) and collaboration with colleagues (Despins, 2017). Other factors that also influence nurses' clinical decision making are organization factors (ten Ham et al, 2017), unit culture (Braaten, 2015), the patient's psychosomatic condition, nursing specialization programs (Aktaş & Karabulut, 2016), as well as protocols (Tonnelier et al, 2005) and reflection (Razieh, Somayeh & Fariba, 2018).

## 2.3. Nursing Science in Greece

Nursing in Greece has its own characteristics. Specifically, nursing education is part of the level of higher education (the duration of studies is four years). Nurses' professional rights in Greece are defined by laws (Presidential Law, 1989). The legal framework in Greece limits nurses' autonomy and thus hinders making clinical decisions (Bakalis, Bowman & Porock, 2003). There is an urgent need to establish new professional rights in order to expand the role of Greek nurses.

Regarding the primary health care, although Health Centers in Greece mainly offer primary care services, they are characterized as underfunded and understaffed. It is generally accepted that in Greece structures that deal with disease such as hospitals have greater funding than primary care which deals with disease prevention.

Emergency room overcrowding is a frequent phenomenon especially in recent years due to the inadequacy of primary care services, lack of organized ERs according to international standards and the increase patient admission due to the economic crisis (from private to public) (Lydakias et al, 2014). In the Medical and Surgical Clinics the nurse play an important role (Douw et al 2018, Hallet et al 2016). Despite each clinics characteristics, they are characterized by nurse understaffing (due to the financial crisis) and lack implementation of nursing protocols, making clinical decisions difficult (Lourantaki & Katsaliaki, 2017). Finally, in a European survey the lowest nurse to-patient ratios have been reported in Greek ICUs (Papathanassoglou et al., 2012). Nurses in ICUs are specialized in the field of intensive care, apply nursing protocols, while at the same time demonstrate the highest rate of clinical decision-making in this field (Evangelou & Hatzibalassi, 2016).

Since there is no similar research conducted in Greece, the purpose of the study was to investigate and compare clinical decisions made by nurses working in Health Centers, Emergency Departments (ERs), Medical and Surgical Clinics and Intensive Care Units (ICUs).

## 3. Materials & Methods

Clinical Decision-Making Cards (CDM Cards) were developed, which were based on the Q methodology to measure the quality of nurses clinical decision-making. Initially, four emergencies

situations were selected, two of which have more medical treatment (Cardiopulmonary Resuscitation, Acute Myocardial Infarction), while the other two need more nursing treatment (Dyspnea, Vomiting). This way the researchers were able to evaluate nurses' clinical decisions in two different types of cases. Each scenario included six different series and were scored in a similar way to Williamson system (Williamson, 1965). Items were weighted as follows, adapted from Williamson (1965): item essential to care for this patient (+2), item facilitates care but not essential (+1), item neither promotes nor impedes care (0), item unnecessary and causes discomfort (-1), item jeopardizes care (-2). However, the scoring system was rephrased, especially the last score (inappropriate care instead of jeopardizes care), to facilitate the aim of the study.

There were no right or wrong answers. The main goal was to measure the autonomy that nurses have in each scenario. Nurses could choose only one card in each row. In all series, there was an option "Call the doctor" card. The "Call the doctor" card was the "inappropriate" clinical decision with a score of -2 in all series (passive role). If the nurses chose the "Call the Doctor" card in two consecutive rows then the scenario would be unsuccessful. A similar method was used by Bakalis, Bowman & Porock (2003) to investigate and measure the quality of nurses' clinical decisions.

For the construction of the CPR scenario, the CPR Protocol within the Hospital of the European Resuscitation Council (Soar et al, 2015) was used, while for the MI scenario, the MI Management Protocol of the European Resuscitation Council (Nikolaou et al, 2015) was used. The CPR scenario was based on the steps for treating an adult patient who has suffered heart attack. Regarding the last two scenarios (dyspnea and vomiting) because no protocols were found during the literature review, the most current methods used to construct these scenarios. More specifically, information on dyspnea was used by Thomas and von Gunten (2002), Campbell (2017) and Papi et al (2018), while on vomiting information was used by Harbord and Pomfret (2013), Keeley (2015) and Pleuvry (2015).

Next, a questionnaire was developed to study the factors influencing nurses' clinical decision-making which was divided into two parts. The first part contained five questions concerning factors influencing clinical decision making and the second part consisted of eleven questions regarding the samples demographic information. Both the cards and the questionnaire were given to a team of experts (one Nursing professor specializing in clinical decisions and two other nurses with many years of experience in both the clinical area and the community). After studying the scenarios, the options and the questionnaire, they submitted their views. After discussion the scripts and the questionnaire took their final form. Cronbach's Alpha reliability index of the questionnaire was equal to 0.783.

### 3.1. Sample

Convenience sampling was used. A total of 87 nurses working in nine public Health Centers and five public hospitals in Athens, Greece participated. During the sampling process, the researchers maintained all the principles of research ethics.

### 3.2. Procedure

Initially the researchers sent a written request to the Regional Health Administration and the hospitals ethics committee in order to get permission to conduct the study. Once permission was granted (approval number: 113/14-3-2019, ΔΑΔΔ/14488/8-3-2019, 9406/26-3-2019, 27/28-2-2019, 7/13-3-2019, 6/26-2-2019) the researchers began collecting the data. Nurses were approached during working hours and informed about the purpose of the study. The nurses individually participated in the research in a space that ensured privacy and without interference. When the participant completed all four scenarios, the questionnaire investigating the factors influencing clinical decision making were also completed.

### 3.3. Data Analysis

Data analysis was performed using three methods:

- 1) the average score,
- 2) the quality of clinical decisions was categorized according to the score obtained in each scenario (minimum score -9, maximum +12). Four categories were constructed: a) inadequate (score -9 to -0.01), b) average (0 to 4), c) good (4.01 to 8), d) very good (8.01 to 12),
- 3) the calculation of the percentage of completion of each scenario per workplace.

## 4. Results

### 4.1. Sample Demographic Information

The majority of the sample were women (87.4%), aged from 25 to 58 years ( $x = 39.1$  years). Most of the sample did not have a post-graduate degree (66.7%) while 50.6% of the sample had an annual family income between € 10,001 to € 20,000. Finally, 19.5% of the sample worked in Health Centers, 18.4% in ERs, 20.7% in Medical Clinic, 18.4% in Surgical Clinic and 23% in ICUs, while their work experience ranged between 6 months to 33 years ( $x = 14.04$  years).

### 4.2. Scenario 1 Results: CPR

In Scenario 1 (CPR) the highest score obtained was by nurses working in ICU ( $x = + 4.50$ ), the second by nurses working in ERs ( $x = + 3.75$ ), nurses working in Surgical Clinics had the third highest score ( $x = + 3.38$ ) while nurses working in Health Centers (average value  $x = -0.35$ ) had the lowest score (Table 1).

In Scenario 1 (CPR) the majority of nurses working in Health Centers made inadequate clinical decisions, nurses in ERs and Medical clinics made inadequate and average clinical decisions,

while nurses in Surgical Clinics received average to good clinical decisions. Finally, the majority of nurses working in the ICU made good to very good clinical decisions.

#### 4.3. Scenario 2 Results: MI

Regarding Scenario 2 (MI) the highest score ( $x = +4.95$ ) was collected by nurses working in ICUs, nurses working in ERs obtained the second highest score ( $x = +4.81$ ) and nurses working in Surgical Clinics obtained the third highest score ( $x = +3.31$ ). Finally, the lowest score was obtained by nurses working in Health Centers ( $x = -0.47$ ) and the second lowest score (value  $x = +0.83$ ) was achieved by nurses working in Medical Clinics (Table 2).

In Scenario 2 (MI) the majority of nurses working in Health Centers, Medical and Surgery clinics made inadequate and average

clinical decisions, while the nurses in ERs and ICUs made good and very good clinical decisions.

#### 4.4. Scenario 3 Results: Shortness of breath

In Scenario 3 (Dyspnea) the highest score was obtained by the nurses working in ICU ( $x = +4.75$ ), the second highest score was collected by the nurses working in Surgical Clinics ( $x = +4.31$ ) and the third highest score ( $x = +3.63$ ) was achieved by nurses working in ERs (Table 3).

In Scenario 3 (Dyspnea), the majority of nurses working in Health Centers and Medical clinics made inadequate and average clinical decisions, while nurses in ERs, Surgical clinics and ICUs made good clinical decisions.

**Table 1:** Characterization of nurses' clinical decision for Scenario 1 (CPR) per workplace.

|                   | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-------------------|----------------|-------|-----------------|------------------|------|
| <b>Inadequate</b> | 64,8%          | 25%   | 38,9%           | 25%              | 15%  |
| <b>Average</b>    | 17,6%          | 31,2% | 38,9%           | 25%              | 25%  |
| <b>Good</b>       | 11,7%          | 18,8% | 16,7%           | 37,5%            | 40%  |
| <b>Very good</b>  | 5,9%           | 25%   | 5,5%            | 12,5%            | 20%  |
| <b>Total</b>      | 100%           | 100%  | 100%            | 100%             | 100% |

**Table 2:** Characterization of nurses' clinical decision for Scenario 2 (MI) per workplace.

|                   | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-------------------|----------------|-------|-----------------|------------------|------|
| <b>Inadequate</b> | 52,9%          | 18,8% | 50%             | 12,5%            | 15%  |
| <b>Average</b>    | 35,3%          | 18,8% | 33,3%           | 50%              | 25%  |
| <b>Good</b>       | 11,8%          | 50%   | 11,2%           | 31,3%            | 35%  |
| <b>Very good</b>  | -              | 12,4% | 5,5%            | 6,2%             | 25%  |
| <b>Total</b>      | 100%           | 100%  | 100%            | 100%             | 100% |

**Table 3:** Characterization of nurses' clinical decision for Scenario 3 (Dyspnea) per workplace.

|                   | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-------------------|----------------|-------|-----------------|------------------|------|
| <b>Inadequate</b> | 52,9%          | 18,8% | 44,4%           | 18,8%            | 5%   |
| <b>Average</b>    | 17,7%          | 18,8% | 16,7%           | 12,5%            | 25%  |
| <b>Good</b>       | 29,4%          | 62,4% | 38,9%           | 62,5%            | 65%  |
| <b>Very good</b>  | -              | -     | -               | 6,2%             | 5%   |
| <b>Total</b>      | 100%           | 100%  | 100%            | 100%             | 100% |

#### 4.5. Scenario 4 Results: Vomiting

In Scenario 4 (Vomiting) the highest score ( $x = +4.65$ ) was collected by nurses working in ICU, nurses working in ERs demonstrated the second highest score ( $x = +3.69$ ) and the third highest score ( $x = +3.44$ ) was achieved by nurses working in Surgical Clinics (Table 4).

In Scenario 4 (Vomiting) the majority of nurses working in Health Centers made inadequate clinical decisions, while nurses in ERs, Medical Clinics, Surgical Clinics and ICUs made average and

good decisions (Table 5).

In all workplaces, most nurses successfully completed the scenarios however in nurses that worked in Medical Clinics demonstrated the lowest completion rate (dyspnea scenario). The highest percentages of successful completion were collected by nurses who worked in the ERs (CPR), Surgical Clinics (MI) while for the ICUs regarding the scenarios dyspnea and vomiting.

#### 4.6. Factors Affecting Clinical Decision Making

The majority of the nurses who worked in the ERs, Medical Clin-

ics, Surgical Clinics and ICUs reported that their nursing protocols in their workplace while nurses working in Health Centers claimed they were none. The majority of nurses working in all structures reported that they have autonomy in their workplace (from not at all to every time) (Table 6).

The majority of nurses who worked in the Health Centers, **ERs**, **Surgical Clinics** and **ICUs** answered negatively, while the nurses in the **Medical Clinics** were divided (Table 7).

The majority of nurses working in Health Centers, Medical Clinics, Surgical Clinics and ICUs answered negatively, while the majority of nurses working in ERs answered positively.

The Kruskal-Wallis test revealed that nurses working in ICUs make the best clinical decisions in the examined scenarios ( $p < 0.05$ ). There is no correlation in terms of statistical significance ( $p > 0.05$ ) regarding the relationship of each scenario score with demographic data (e.g age, clinical experience).

**Table 4:** Characterization of nurses' clinical decision for Scenario 4 (Vomiting) per workplace.

|                   | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-------------------|----------------|-------|-----------------|------------------|------|
| <b>Inadequate</b> | 52,9%          | 12,5% | 16,7%           | 12,4%            | 15%  |
| <b>Average</b>    | 35,6%          | 43,8% | 44,4%           | 43,8%            | 35%  |
| <b>Good</b>       | 11,5%          | 37,5% | 33,4%           | 43,8%            | 30%  |
| <b>Very good</b>  | -              | 6,2%  | 5,5%            | -                | 20%  |
| <b>Total</b>      | 100%           | 100%  | 100%            | 100%             | 100% |

**Table 5:** Scenarios success rates of completion per workplace (%).

|                             | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-----------------------------|----------------|-------|-----------------|------------------|------|
| <b>Scenario 1: CPR</b>      | 76,5%          | 93,7% | 77,8%           | 100%             | 85%  |
| <b>Scenario 2: MI</b>       | 64,7%          | 87,5% | 66,7%           | 93,7%            | 85%  |
| <b>Scenario 3: Dyspnea</b>  | 64,7%          | 81,2% | 55,6%           | 87,5%            | 95%  |
| <b>Scenario 4: Vomiting</b> | 58,8%          | 87,5% | 83,3%           | 87,5%            | 95%  |

**Table 6:** Do you think doctors limit your autonomy in your workplace?

|                   | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-------------------|----------------|-------|-----------------|------------------|------|
| <b>Not at all</b> | 17,7%          | 6,2%  | 16,7%           | 12,5%            | 5%   |
| <b>Rarely</b>     | 47%            | 50%   | 33,4%           | 62,5%            | 50%  |
| <b>Often</b>      | 5,9%           | 25%   | 44,4%           | 18,8%            | 40%  |
| <b>Very often</b> | 11,7%          | 6,2%  | -               | 6,2%             | 5%   |
| <b>Every time</b> | 17,7%          | 12,6% | 5,5%            | -                | -    |
| <b>Total</b>      | 100%           | 100%  | 100%            | 100%             | 100% |

**Table 7:** Do think that doctors restrict you from making clinical decisions in your workplace?

|                   | Health Centers | ERs   | Medical Clinics | Surgical Clinics | ICUs |
|-------------------|----------------|-------|-----------------|------------------|------|
| <b>Not at all</b> | 5,9%           | 6,2%  | 27,8%           | 18,8%            | 15%  |
| <b>Rarely</b>     | 47%            | 31,2% | 50%             | 37,4%            | 40%  |
| <b>Often</b>      | 11,8%          | 43,8% | 16,7%           | 25%              | 40%  |
| <b>Very often</b> | 11,8%          | 6,2%  | -               | 18,8%            | 5%   |
| <b>Every time</b> | 23,5%          | 12,5% | 5,5%            | -                | -    |
| <b>Total</b>      | 100%           | 100%  | 100%            | 100%             | 100% |

## 5. Discussion

The present study found that nurses make better decisions in scenarios that involve more nursing decisions and actions (shortness of breath and vomiting) than in scenarios with more medical decisions and procedures (CPR and MI). Similar results were reported by Bakalis, Bowman & Porock (2003).

Also, nurses who worked in Health Centers, although they successfully completed all the studied scenarios, made average clinical decisions for dyspnea and inadequate clinical decisions in CPR, MI and vomiting. It seems that the underestimated role of the nurse in Health Centers, are the main reasons for the average quality of clinical nursing decisions.

Regarding nurses working in ERs, they made good clinical decisions for MI, probably because this is a common occurrence in ERs, while on the contrary they made average clinical decisions for CPR, dyspnea and vomiting, which contradicts the fact that Nurses working in ERs are as autonomous as nurses working in ICUs in terms of emergency management (Al-Adwan, Stanford & Hamner 2017, Traub, Temkit & Saghafian, 2017, Karra et al 2014).

As for the nurses working in Medical Clinics and Surgical Clinics, they made average clinical decisions for CPR, MI, dyspnea and vomiting, mainly due to lack of nursing protocols and unclear duties. Finally, nurses working in ICUs made good and very good clinical decisions for CPR, MI, dyspnea and vomiting due to the severity of the incidents they host and the emergencies that often occur within this setting.

## 6. Limitations

In the present study the sample was small although it was taken from the largest health district in Greece. In addition, due to small sample size generalizations should be made with caution. Also, the research focused only on four scenarios related to nursing practice, as well as the frequency of incidents that occurred in the studied workplaces differed significantly.

## 7. Conclusions

The present study showed that nurses successfully completed all scenarios. As for the nurses working in Health Centers they make low quality clinical decisions, while nurses in ICUs are made better clinical decisions. In addition, nurses working in ERs, medical and surgical clinics make average to good clinical decisions. The clinical setting in which nurses work, seems to play an important role in the quality of clinical decisions.

## 8. Future Recommendations

Nurses' clinical decisions significantly determine the patient's prognosis and outcome, especially in emergency situations. It is therefore of great importance to provide guidelines and protocols in Greece, in order to improve nurses clinical decisions. It is worth noting that CPR skills must be updated frequently (6 to ten months) in order for nurses to involve successfully in the management of cardiac arrest (Makinen et al 2009, Mpotos et al 2015).

In addition, with regard to nursing specialties, Community Nursing, Emergency Nursing and Intensive Care Nursing should definitely be added. Furthermore, legislation is the most important and determining factor in nursing clinical decision making. It is therefore imperative to upgrade nurses' professional rights. Finally, continuing education must be active, in every health sector, while factors that influence Greek nurses' clinical decision making need further investigation, in order to optimize future nursing care and nurses clinical decisions.

## References

1. Aktaş YY, Karabulut, N. A Survey on Turkish nursing students' perception of clinical learning environment and its association with academic motivation and clinical decision making. *Nurse Education Today*. 2016; 36: 124-8.
2. Al-Adwan O, Stanford J, Hamner M. Examining the Utilization of Medical Scribes in a Hospital Emergency Department Environment. *Procedia Computer Science*. 2017; 118: 34-47.
3. Al Sabei SD, Lasater K. Simulation debriefing for clinical judgment development: A concept analysis. *Nurse Education Today*. 2016; 45: 42-7.
4. Bakalis N, Bowman GS, Porock D. Decision making in Greek and English registered nurses in coronary care units. *Int J Nurs Stud*. 2003; 40 (7): 749 - 760.
5. Banning M. A review of clinical decision making: models and current research. *Journal of Clinical Nursing*. 2008; 17: 187-195.
6. Braaten JS. Hospital system barriers to rapid response team activation: A cognitive work analysis. *American Journal of Nursing*. 2015; 115(2): 22-33.
7. Campbell ML. Dyspnea. *Critical Care Nursing Clinics of North America*. 2017; 29: 461-70.
8. Cuia C, Lia Y, Gengb D, Zhanga H, Jinc C. The effectiveness of evidence-based nursing on development of nursing students' critical thinking: A meta-analysis. *Nurse Education Today*. 2018; 65: 46-53.
9. Despina LA. Factors influencing when intensive care unit nurses go to the bedside to investigate patient related alarms: A descriptive qualitative study. *Intensive and Critical Care Nursing*. 2017; 43: 101-107.
10. Douw G, Huisman-de Waal G, van Zanten ARH, van der Hoeven JG, Schoonhoven, L. Surgical ward nurses' responses to worry: An observational descriptive study. *International Journal of Nursing Studies*. 2018; 85: 90-5.
11. Evangelou X, Hatzibalassi M. Oral Health Hygiene in Patients Under Mechanical Ventilation: Knowledge Attitudes and Practices of Intensive Care Nurses. *Nursing*. 2016; 55: 41-51.
12. Finkelman A. Problem-solving, decision making and critical thinking: how do they mix and why bother? *Home care provider*. 2001; 6(6): 194-198.
13. Johansen ML, O'Brien JL. Decision Making in Nursing Practice: A Concept Analysis. *Nurs Forum*. 2016; 51(1): 40-48.
14. Hallet J, Wallace D, El-Sedfy A, Ahmed N, Smith AJ, Nathens AB, Conn LG, Coburn NG. Defining Communication Improvement Needs in General Surgery: An Analysis of Pages, Communications, Patterns, and Content. *Journal of Surgical Education*. 2016; 73: 959-967.
15. Harbord M, Pomfret S. Nausea and vomiting. *Medicine*. 2013; 41: 87-91.
16. Karra V, Papathanassoglou ED, Lemonidou C, Sourtzi P, Giannakopoulou M. Exploration and classification of intensive care nurses' clinical decisions: a Greek perspective. *Nursing in Critical Care*.

- 2014; 19: 87-97.
17. Keeley PW. Nausea and vomiting. *Medicine*. 2015; 43: 709-711.
  18. Khamseh F, Parandeh A, Hajjiamini Z, Tadrissi SD, Najjar M. Effectiveness of applying problem-solving training on depression in Iranian pregnant women: Randomized clinical trial. *J Educ Health Promot*. 2019; 8:87.
  19. Kydonaki K, Huby G, Tocher J, Aitken LM. Understanding nurses' decision-making when managing weaning from mechanical ventilation: a study of novice and experienced critical care nurses in Scotland and Greece. *Journal of Clinical Nursing*. 2016; 25: 434-444.
  20. Lourantaki I, Katsaliaki K. The global expansion of the professional role of nurses. *Hellenic Medicine Archives*. 2017; 34: 303-320.
  21. Ludin SM. Does good critical thinking equal effective decision-making among critical care nurses? A cross-sectional survey. *Intensive and Critical Care Nursing*. 2018; 44: 1-10.
  22. Lydakakis Ch, Patramanis I, Lavrentaki K, Karavitaki M, Neofotistos G. Overcrowding in emergency departments: The role of the "Low Risk Disaster Management Clinic". *Hellenic Medicine Archives*. 2014; 31: 336-41.
  23. Mäkinena M, Niemi-Murolaa L, Kaila L, Castrénc M. Nurses' attitudes towards resuscitation and national resuscitation guidelines—Nurses hesitate to start CPR-D. *Resuscitation*. 2009; 80: 1399–1404.
  24. Manetti W. Sound clinical judgment in nursing: A concept analysis. *Nurs Forum*. 2019; 54(1):102-110.
  25. Marino MA, Andrews K, Ward J. Clinical Decision Making at the bedside. *Nursing Clinics of North America*. 2020; 55(1): 29-37.
  26. Merisier S, Larue C, Boyer L. How does questioning influence nursing students' clinical reasoning in problem-based learning? A scoping review. *Nurse Education Today*. 2018; 65: 108-15.
  27. Mpotos N, Decaluwe K, Van Belleghem V, Cleymans N, Raemaekers J, Derese A, et al. Automated testing combined with automated retraining to improve CPR skill level in emergency nurses. *Nurse Education Today*. 2015; 15: 212-217.
  28. Nibbelink CW, Brewer BB. Decision making in nursing practice: an integrative literature review. *Journal of Clinical Nursing*. 2018; 27: 917-928.
  29. Nikolaou NI, Arntz HR, Bellou A, Beygui F, Bossaert LL, Cariou A. European Resuscitation Council Guidelines for Resuscitation 2015 Section 8. Initial management of acute coronary syndromes. *Resuscitation*. 2015; 95: 264-77.
  30. Papataniasiou J. Critical thinking in nursing practice: current for 2016 as never before. *Hellenic Journal of Nursing Science*. 2016; 9: 3-7.
  31. Papataniassoglou ED, Karanikola MN, Kalafati M, Giannakopoulou M, Lemonidou C, Albarran JW. Professional autonomy, collaboration with physicians, and moral distress among European intensive care nurses. *American Journal of Critical Care*. 2012; 21: e41-52.
  32. Papi A, Brightling C, Pedersen SE, Reddel HK. Asthma. *The Lancet*. 2018; 391: 783-800.
  33. Pleuvry BJ. Physiology and pharmacology of nausea and vomiting. *Anaesthesia & Intensive Care Medicine*. 2015; 16: 462-6.
  34. Presidential Law, 351/1989. Determination of Professional rights of the graduates from the departments a) Nursing, b) Midwifery, c) Health Visitors of the School of Health and Welfare Professions and d) Department of Public Health, School of Management and Economics (Law 159 / A / 14-6-1989).
  35. Rababa M, Al-Rawashdeh S. Critical care nurses' critical thinking and decision making related to pain management. *Intensive & Critical Care Nursing*. 2021; 63: 10300.
  36. Razieh S, Somayeh G, Fariba H. Effects of reflection on clinical decision-making of intensive care unit nurses. *Nurse Education Today*. 2018; 66: 10-14.
  37. Román-Cereto M, García-Mayor S, Kaknani-Uttumchandani S, García-Gámez M, León-Campos A, Fernández-Ordóñez E, et al. Cultural adaptation and validation of the Lasater Clinical Judgment Rubric in nursing students in Spain. *Nurse Education Today*. 2018; 64: 71-78.
  38. Soar J, Nolan JP, Böttiger BW, Perkins GD, Lott C, Carli P, et al. European Resuscitation Council Guidelines for Resuscitation 2015 Section 3. Adult advanced life support. *Resuscitation*. 2015; 95: 100-47.
  39. Sommers C. Measurement of critical thinking, clinical reasoning, and clinical judgment in culturally diverse nursing students – A literature review. *Nurse Education in Practice*. 2018; 30: 91-100.
  40. Stillman RC. Clinical Decision Support Tools Improving Cancer Care. *Seminars in Oncology Nursing*. 2018; 34: 158-67.
  41. Taner CA. Thinking Like a Nurse: A Research-Based Model of Clinical Judgment in Nursing. *Journal of Nursing Education*. 2006; 45(6): 204-11.
  42. ten Ham W, Ricks EJ, van Rooyen D, Jordan PJ. An Integrative Literature Review of the Factors That Contribute to Professional Nurses and Midwives Making Sound Clinical Decisions. *International Journal of Nursing Knowledge*. 2015; 28 (1): 19-29.
  43. Thomas JR, von Gunten CF. Clinical management of dyspnoea. *The Lancet Oncology*. 2002; 3: 223-8.
  44. Tonnelier JM, Prat G, LeGal G, Gut-Gobert C, Renault A, Boles JM, LHer E. Impact of a nurses' protocol-directed weaning procedure on outcomes in patients undergoing mechanical ventilation for longer than 48 hours: a prospective cohort study with a matched historical control group. *Critical Care*. 2005; 9: R83-9.
  45. Traub SJ, Temkit M, Saghafian S. Emergency Department Holding Orders. *The Journal of Emergency Medicine*. 2017; 52: 885-93.
  46. Williamson JW. Assessing clinical judgment. *Journal of Medical Evaluation*. 1965; 40: 180-187.