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**NURSE'S STRATEGIES OF CLINICAL REASONING
IN CRITICAL CARE:
A SYSTEMATIC REVIEW OF LITERATURE**

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ABSTRACT

Identify clinical reasoning strategies of nurses in critical care. A systematic review of the literature with the PIC(O) was held in the EBSCO (CINAHL (Plus with Full Text), MEDLINE (Plus with Full Text)), with time limit between 2009 - 2015, of which 8 articles were selected.

The clinical reasoning strategies nursing that emerged from the study were: as the development of effective relationship with the patient and family involvement, application of negotiation and compromise skills, use of critical-reflective skills for selection of nursing interventions, intuition, recognition of similar situations and hypothesis testing. And as clinical reasoning criteria the nurse assesses the risk-benefit for patients, organizational needs and sources of information⁽¹⁾. This study helped identify some strategies and clinical reasoning criteria nurse who cares for patients in critical condition. However, more studies are needed to deepen knowledge about the clinical reasoning process by promoting best results from the autonomous intervention and nursing decision making.

Descriptors: Clinical Reasoning; decision making; nursing care.

INTRODUCTION

In the last decades, organizations responsible for health care have been challenged daily to achieve goals that guarantee excellence, safety and customer satisfaction. This commitment to quality of care has placed nurses new and extraordinary goals for the development and growth of the nursing discipline and profession. To achieve these nursing profession has obtained scientific evidence that potentiates and consolidates knowledge and contributions to daily clinical practice, promoting an adequate response to the expectations of the clients and the cost effectiveness. This responsibility and autonomy of nursing practice leads to a greater need to expand knowledge about the process of clinical reasoning and decision making. Awareness of the components and factors that influence clinical reasoning has been associated with a greater effectiveness of the nursing intervention, preventing complications for the client, providing and guaranteeing to clients, family and community, safe, competent and quality care^(3,5,6,11,15-17). The various researches have been focused on clinical judgment, decision making and critical thinking, but the concept of clinical reasoning and its process have been pointed out as insufficiently developed.

Clinical reasoning is present throughout the all scopes of nurses' performance, and in this study we focus on **critical services**. Assuming the concept of a critically ill client defined by SPCI (1997, p. 3) "... is one that, due to dysfunction or profound failure of one or more organs or systems, its survival depends on advanced means of monitoring and therapeutics", implying constant and multidisciplinary observance and vigilance in medium and high risk services, encompassing it as a whole and articulating means and strategies to achieve the desired ends. These services are characterized by particular aspects as it is also referred to by Ramezani-Badr et al. (2009, p.352) "Critical care patients are different from others and whose clinical situation can vary rapidly." Nursing intervention in clients in critical situations assumes particular characteristics, determined by the unpredictability and speed, requiring the professionals a body of knowledge that allow them to mobilize and develop professional, personal and experience skills for early and timely care to the client.

According to Eliot (2010), clinical reasoning strategies are developed based on the construction of an effective relationship between nurses and clients and their involvement as partners in health care. At the same time, the involvement of the family allows the collection of information that usually complements the client's health and illness history and the clinical situation, and the presence of the family increases the client's well-being, who feels more relaxed and involved in care. At the same time, the intuition, the recognition of similar situations and hypothesis testing are strategies that are also considered as actors in the decision making process in critically ill clients⁽¹¹⁾. For Ramezani-Badr et al. (2009) the nurse organizes, reorganizes, mobilizes resources and strategies building a set of favorable conditions for clinical decision making. Being that, the clinical reasoning is continuous and happens helically, conditioned by multiple factors such as the professional and personal competencies of the nurse, client characteristics, context, number of working hours, quality of communication, decision-making power and professionals' experience^(2-3,4,7,12,15). This process of interaction is continuous giving the nursing professional the capacity for early intervention as well as the prevention of future complications^(2-3,15).

Based on the following assumptions, nurses' clinical reasoning ability is fundamental to select and analyze pertinent information, so that the decision taken in relation to nursing interventions is the most appropriate to the client and its clinical situation and context. In view of the above, the need to identify which strategies of clinical reasoning are mobilized by nurses in decision making in critical care services emerges, through a systematic review of the literature.

METHOD

For the systematic review of the literature, the following question was formulated in a PICO⁽¹⁴⁾ format: “**Which clinical reasoning strategies** (O-Results) **used by nurses** (P- Population) **who take care of critical clients** (nursing intervention)? “. We used the EBSCO search engine, using two databases: CINAHL (Plus with Full Text) and MEDLINE (Plus with Full Text), using the following descriptors: [(clinical reasoning) OR (judgment) OR (decision-making) OR (problem-solving) OR (nursing theory) OR (evidence-based nursing) OR (evidence-based practice) AND [(advanced practice nursing) OR (critical care nursing) OR (education nursing) OR (emergency care) OR (nursing care)] AND [(acute care) OR (emergency room) OR (critical care)], as explained in Figure 1. Considering the need to identify strategies of clinical reasoning of nurses who take care of clients in a critical situation, we will look for the potential of qualitative research that may show strategies that are not yet visible to the professionals' evaluation. Thus, it was decided to include all empirical studies, accepting those from level I to level VI of scientific evidence⁽¹⁴⁾.

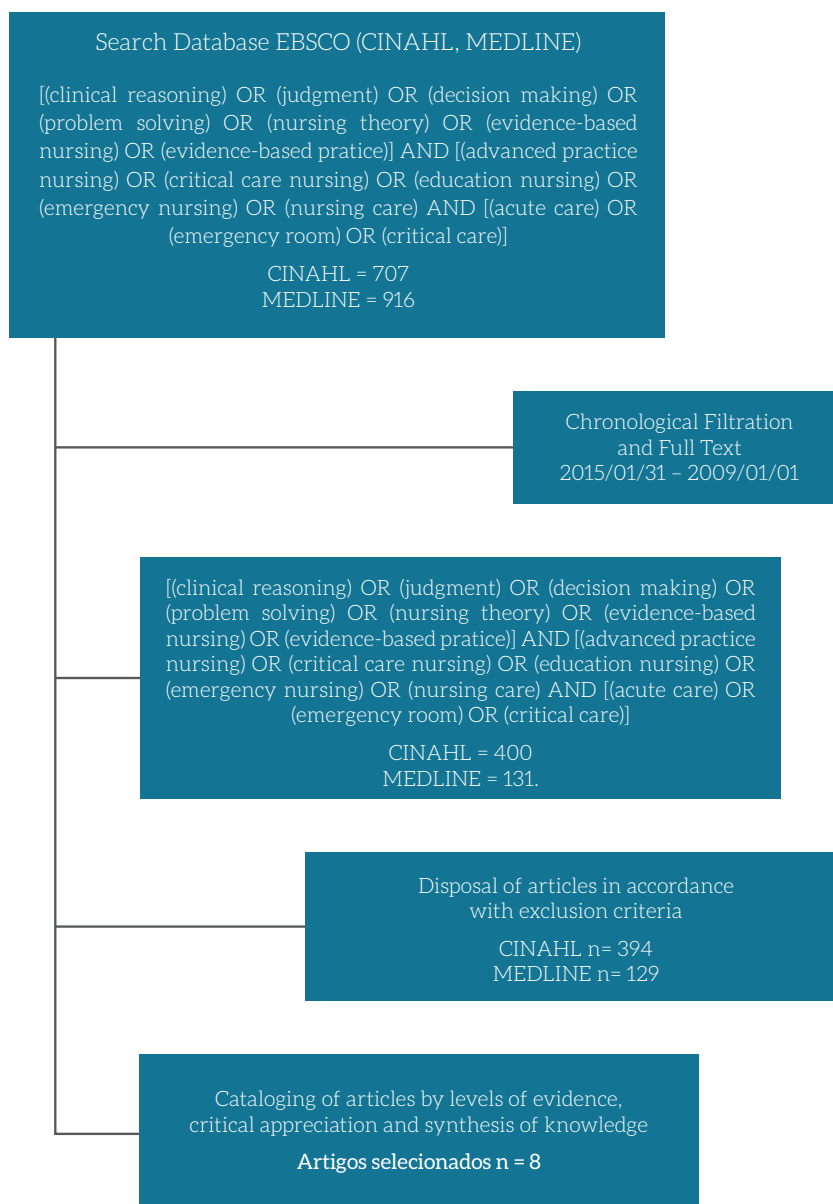


Figure 1 – Process of research and selection of articles - Research CINAHL, MEDLINE - Period 2009-2015.

The type of articles included were full texts published in journals from January 2009 to January 2015. We used the following inclusion criteria: articles describing all contexts of critical care (hospital - critical customer units); participants who were nurses. Exclusion criteria: lack of methodological rigor (articles that did not describe the type of study used and involved only the nurses' experiences) and contexts outside the inclusion criteria or their non-specification (Stillwell, Fineout-Overholt, Melnyk, & Williamson, 2010). The research strategy resulted in 1623 articles (MEDLINE 916 articles and CINAHL 707), after placing full text and temporal limitation we obtained 131 articles in MEDLINE and 400 in CINAHL, of which 8 were included (Figure 1).

RESULTS

The systematic review included the analysis of eight studies (two published in 2009, two in 2010, one in 2012, one in 2013 and two in 2014), as an observation field the clinical reasoning strategies applied by nurses who take care of clients in a critical situation. In Table 1 we can verify the results obtained from the analysis of the articles.

Table 1 – Corpus of Analysis - Research CINAHL, MEDLINE - Period 2009-2015.

Level of Evidence	Method	Participants	Results
Level of Evidence: VI ⁽⁶⁾	Qualitative Study - Grounded Theory (Interviews)	21 nurses	- Several strategies of clinical reasoning have been identified: a) Development of effective relationship with clients; b) Negotiation skills and commitment are essential; c) Family engagement; d) Reflection and critical thinking skills (critical-reflexive thinking) e) Nursing / client interaction.
Level of Evidence: VI ⁽¹¹⁾	Qualitative Study (in-depth interviews)	14 nurses	The strategies of clinical reasoning and criteria that were found are: <u>1st Instance:</u> - Intuition; - Recognition of similar situations; - Hypothesis testing; <u>2nd Instance (Criteria):</u> - Risk-benefit assessment for the client; - Organizational needs; - Complementary sources of information.
Level of Evidence: VI ⁽⁷⁾	Qualitative Study - Content analysis (retrospective interviews)	8 nurses (4 experts and 4 beginners)	- Experts collect a wide range of information (almost twice as much) and group this information together; - More proactive in data collection, anticipating problems
Level of Evidence: IV ⁽¹⁰⁾	Quantitative, cross - sectional study (descriptive - multiple regression) Questionnaires	177 nurses	- Mastery of self-control and problem solving skills; - Self-control capability is essential for decision-making as well as experience in collecting information.
Level of Evidence: V ⁽¹²⁾	Quantitative Study Non-experimental, descriptive Questionnaires	605 nurses	- Nursing care is hampered by fatigue; - Decision making is affected by fatigue by bringing feelings of regret to nurses
Level of Evidence: V ⁽⁹⁾	Quantitative Study Delphi Technique (Two rounds) Analytical and descriptive statistics	44 nurses (1st round) 34 nurses (2nd round)	- The competences are classified in 5 areas: a) Basic knowledge; b) Basic skills; c) Attitudes and basic values; d) Professional experience; e) Personal characteristics of the nurse.

Table 1 – Corpus of Analysis - Research CINAHL, MEDLINE - Period 2009-2015.

Level of Evidence	Method	Participants	Results
Nível de evidência: VI ⁽⁸⁾	Qualitative Study exploratory descriptive (Questionnaire and interviews)	10 nurses (newly formed)	-The simulation prepared them to take care with confidence; - Helped to understand and to make decisions to improve customer care; It turned out to be an excellent strategy to promote skills of critical thinking, learning and trust.
Nível de evidência: V ⁽⁴⁾	Quantitative Study and Grounded Theory	1201 nurses	- The body of knowledge and environmental conditions are essential for the quality of care; - The environment is a predictive dimension in the quality of care; - The characteristics of the work including the workload influence the capacity in the decision making; - The breadth and flexibility of the decision influence the quality of care.

We found that the articles that emerged for the systematic review are mostly level VI studies (N = 4), following the level of evidence V (N = 3) and with less expression level of evidence IV (N = 1). The analysis made to the RSL articles allowed us **to obtain three dimensions of analysis** on this problem. The first one refers to the strategies and criteria of clinical reasoning of nurses, the second describes the personal and professional competences that characterize the nurses working in these contexts and finally, we have obtained some conditions that can influence the clinical reasoning of the nurses (Table 2).

From the first dimension of analysis emerges the strategies of clinical reasoning that nurses apply to clients, in a critical situation. **The nurse/client relationship and family engagement; negotiation and commitment skills; critical-reflexive skills; intuition; recognition of similar situations** and **hypothesis testing**.

- **Effective nurse/client relationship** - the development of a relationship of trust between the nurse and the client (mutual interaction), allows the client to trust and share all his current history or information, simplifying and improving the nurses' reasoning process over the clinical situation⁽⁶⁾.
- **Relationship of family engagement** - involving the family in the care process brings benefits to the client, who feels supported and strengthened by the family presence and at the same time the family helps in the decision making of the client, providing useful information and making them responsible⁽⁶⁾.
- **Negotiation skills and commitment** - these competences are essential to intensify and deepen the relationship that the client establishes with the nurse, through this feedback mechanism, the nurse involves the client in his clinical situation, and this is a central element in the decision⁽⁶⁾.
- **Reflection and critical thinking skills** - these competencies improve the nurses' ability to process the information collected, the observations, the results obtained to better adjust nursing interventions and evaluate the results (Elliott, 2010).
- **Intuition** - it is composed of the knowledge, experience and expertise of the nurse, allowing him / her to identify signs of alarm and / or complications, to establish nursing diagnoses and to decide on interventions quickly^(6,11).
- **Recognition of similar situations** - allows the nurse to find a response to a clinical case recalling previous experiences and facts, transferring knowledge and interventions previously experienced (pallor, tachycardia, confusion, resembles shock)⁽¹¹⁾.

- **Hypothesis testing** - the nurse through the client's information, signs and symptoms puts diagnostic hypotheses that she accepts or disdains as she obtains new information (client responses, information, results, etc.). Systematic input of information and data requires nurses to gather information and stratify data, making them available and accessible at the right time⁽¹¹⁾.

In the second dimension we can see the type of personal and professional competences of nurses such as the **capacity for self-control, experience in collecting information and professional skills**.

- **Capacity for self-control** - this capacity proved to be essential to this exercise which is guided by the care of clients in situations of permanent instability and unpredictability of response to nursing interventions. To solve problems in a short space of time⁽¹⁰⁾.
- **Experience in collecting information** - nurses in these contexts must be experienced, quick and creative in gathering information to obtain pertinent and useful information for solving client problems⁽¹⁰⁾.
- **Professional competences** - nurses who care for critically ill clients should be holders of five domains of competencies that are structuring their performance, such as general scientific knowledge, general professional competences, general attitudes and values, professional experience and personal characteristics of nurses^(4,9,13).

In the third dimension of analysis we have obtained some factors that can influence the clinical reasoning, **such as teaching/learning techniques, working conditions and environmental conditions**.

- **Teaching/learning techniques** - professionals assume that teaching/learning techniques developed in training have shown good results in the development of clinical reasoning, trust in decision making and in the promotion of critical and reflexive thinking capacities through clinical situations⁽⁸⁾.
- **Conditions of work** - increased workload and reduced hours of sleep may affect decision making and, consequently, impair the quality of nursing care. These decisions that occur at times of greater fatigue sometimes lead nurses to feelings of regret and failure, as they later perceive them as less coherent⁽¹²⁾. Also, the reduction of the amplitude and flexibility in the professional autonomy of the nurses influences the decision making⁽⁴⁾.

- **Environmental conditions** - are essential to the quality of the nursing intervention, since the structural, organizational and environmental characteristics of the services influence the well-being and professional performance of individuals⁽⁴⁾.

The reflection in the different studies allows us to perceive that a nurse/client trust relationship is fundamental for the development of the nurses' clinical reasoning, taking into account that this mutual interaction creates in the client a relationship of trust and safety in the nurse, making him easier to provide information and data. The client realizes that the nurse takes an interest in himself (his thoughts, fears, anguish, beliefs and values), and this way, he engages with greater commitment, satisfaction and responsibility in his health. The literature shows the importance of family commitment in health care, either as a care partner or as a liaison with the client. Also the professional competences and personal characteristics of the nurse are essential to the development of the clinical reasoning, making it faster and more effective. Continuous training, working conditions and environmental conditions are factors that influence nurses' ability to make decisions.

In addition, clinical reasoning strategies are selected based on criteria that take into account the client's interests, the organization's interests, and, lastly, other information that may support the choice of the most acceptable strategy. Making the right decision, for the right reason, the right customer, at the right time, and with the right information.

Table 2 – Results of systematic literature review - Question PI[C]O

“What are the clinical reasoning strategies used by nurses who care for critically ill clients?”

1st Dimension of Analysis - Strategies and Criteria of nursing

Relationship of trust with the client and family engagement:	<ul style="list-style-type: none"> • Person-centered nursing care • Family-centered nursing care • Sharing responsibility in clinical decision • Confidence level in nursing care • Feeling of Commitment and Empathy • Existence of mutual interaction
Negotiation skills and commitment:	<ul style="list-style-type: none"> • Quality of feedback between client and nurse • Respect for the client's wishes • Guaranteed informed consent • Capacity for self-care
Critical-reflexive competences:	<ul style="list-style-type: none"> • Capacity for in-depth analysis of data and information • Capacity of selection of data • Reflection on the interventions implemented and results
Intuition:	<ul style="list-style-type: none"> • Theoretical and scientific knowledge of nurses • Personal and professional characteristics of nurses • Professional experience • Expertise level • Ability to anticipate problems
Recognition of similar situations:	<ul style="list-style-type: none"> • Experience in similar situations • Transfer of knowledge from other clinical cases
Hypothesis testing:	<ul style="list-style-type: none"> • Establishment of priorities • Formulation of various diagnostic hypotheses, acceptance or rejection of hypotheses

Table 2 – Results of systematic literature review - Question PI[C]O

“What are the clinical reasoning strategies used by nurses who care for critically ill clients?”

2nd Dimension of Analysis - Professional and Personal Competencies of the nurse

Self-control ability:	<ul style="list-style-type: none"> • Self-control ability • Problem solving
Experience in collecting information:	<ul style="list-style-type: none"> • Be creative and innovative in the sources of information • Articulate sources of information • Evidence-based practice
Professional skills:	<ul style="list-style-type: none"> • General scientific and technical knowledge • Communication skills and interpersonal relationship • Ethical-deontological competences • Instrumental capacity • Personal characteristics

3rd Dimension Analysis - Conditions that influence clinical reasoning

Teaching/learning techniques:	<ul style="list-style-type: none"> • Simulation • Replicate clinical cases • Develop confidence and decision-making capacity
Conditions of work:	<ul style="list-style-type: none"> • Ratio of nurse / client • Working hours • Leadership style
Environmental conditions:	<ul style="list-style-type: none"> • Physical structure • Multiprofessional relationship • Relationship between peers

DISCUSSION

The analysis of the studies deepened the state of the art of the clinical reasoning strategies of nurses who care for critically ill clients showing particular characteristics of this field of intervention, as well as the professional competencies and characteristics of the nurses who work in these services.

The nurse/client trust relationship appears as a structuring pillar to the care process in critically ill clients⁽⁶⁾, where the client provides pertinent information about himself, his clinical situation and other elements that may be important to the construction of clinical reasoning^(6,10). This relationship of feedback between both gets better with the greater the involvement achieved, thus enhancing the success of the results obtained. This link between nurse and client has been a focus of interest in several research studies where the properties and relevance in caregiving have become evident, but in services where everything happens so quickly the nurse has to get from the client a feeling of trust and security with the aim of obtaining consent to implement nursing interventions in a short space of time. Since the nurse and the client usually do not know each other, and sometimes the first contact happens at times when the client's situation may be in a limit situation, we realize the complexity of creating this bond. At the same time, it can be seen that these nurses have personal characteristics and specific professional competencies that allow them to quickly obtain the client's trust, so that the client provides data and information, involving himself as a partner in nursing care^(6-7,9). **The presence and engagement of the family** is a crucial element in establishing a relationship of trust and empathy with the nurse, and the client is quieter and safer to make decisions regarding his/her health/illness⁽⁶⁾.

The **professional competencies** and **personal characteristics** of the nurses were evidenced by Benner (1984) and Tanner (2006), where they clearly defined areas of competence and personal characteristics of nurses for the exercise in intensive care units, but this work evidences the EQ (emotional quotient) in the **capacity of self-control** as fundamental to the decision making and problem solving in services of critical clients⁽¹⁰⁾. Assuming that in these environments clients are permanently in a situation of instability and unpredictability of response to nursing interventions requiring nurses the ability to alert permanently to act always and at any time. The inconstancy of clients and pathologies that characterize these services require trained professionals with high emotional intelligence to dominate and control emotions, responding consistently and in a timely manner to the needs of clients. Also Hoffmam et al. (2009) and Lakanmaaa, R.-L., Suominenb et al. (2012) state that nurses' personal characteristics, attitudes, and values are essential to the performance of roles in critical customer services.

The ability to collect information in a creative and innovative way is a novelty in the range of nurses' competences in relation to previous studies. Newman (2014) assumes that nurses must be trained in collecting from complementary sources, since these services are characterized by uncertainty and non-routine tasks, where almost nothing is predictable, so it is paramount that nurses master innovative strategies in collecting information about the client, pathologies, interventions or other data that lead to permanent updating. As in Ramezani-Badr et al. (2009), which states that the nurse must be prepared to collect information in complementary sources, while Elliot (2010) mentions that the nurse must be capable of critical-reflexive thinking to critically analyze the information obtained. In the many definitions of the authors in relation to the professional competences of nurses, the importance of skills in the field of information collection and analysis is evident, being considered as essential to the quality of the care provided.

Fatigue and decreased hours of sleep indicated in these studies as influencing the nurses' capacity for clinical reasoning and decision-making⁽¹²⁾, impairing their actions and leading nurses to less coherent decisions of which they become aware only later and, for this reason they are assaulted by feelings of anguish and regret. These decisions made by nurses originated in moments of greater workload and fatigue^(4,12). Simultaneously, the characteristics of the work, the communication between peers and the level of autonomy influence the decision-making capacity of nurses in client services in critical situation⁽⁴⁾. These components influencing the quality of care of nurses had already been studied, but the fatigue and the decrease of the hours of sleep in relation to the decision-making capacity of the nurses in services of critically ill clients seems to be a new finding.

The expertise in assisting clients in critical situations was once again evident in multiple studies^(7,9,11) as Benner (1984) and Tanner (2006) had already proved. The expert nurse has a set of capabilities that allow her to respond more effectively and quickly to clinical cases, applying her professional experience, technical and scientific knowledge and expertise.

Teaching/learning strategies such as simulation techniques were assumed by professionals as a useful tool for the development of clinical reasoning and for decision making⁽⁸⁾. These strategies, in addition to replicating clinical cases, help increase nurses' confidence in the decisions they make while promoting critical thinking skills. Thus, it seems important that services that assist clients in critical situations promote continuous training by applying simulation techniques that strengthen nurses' skills in clinical reasoning and decision making, improving professional performance. As stated by Elliot (2010) it is important that nurses hold critical-reflexive thinking skills in the evaluation of clinical cases. In addition to these facts, we found that Ramezani-Badr et al. (2009) identified the recognition of similar situations as a strategy frequently used by nurses in the construction of

clinical reasoning, if this is the case, improving this strategy through simulation will bring advantages to the quality of care.

In the study developed by Elliot (2010) and Ramezani-Badr et al. (2009) we can see the **strategies of clinical reasoning of nurses** to critically ill clients. At the same time, when identifying them, they demonstrate the intrinsic and specific competences of these professionals, such as the ability to establish a nurse/client trust relationship, nurses' negotiating, commitment and critical-reflexive competencies, intuition and professional experience. This repertoire of competencies corroborates the five domains of competence mirrored in the study by Lakanmaaa, R.-L., Suominenb et al. (2005), as well as the competencies described by Benner (1984) and Tanner (2006), assuming that nurses dealing with critically ill clients exhibit a body of general knowledge, general skills, attitudes and values, professional experience and personal characteristics. This intermingling of strategies and competencies inherent to professionals are articulated in the construction of clinical reasoning so that it happens efficiently and quickly. However, the nursing intervention seems not to be transversal to all nurses, it is noticeable in the research of Hoffmam et al. (2009) that expert nurses can more accurately and rigorously obtain nursing diagnoses in less time and perform a more extensive and exhaustive information gathering than beginners. The experts gather more information aiming to infer in a current way a clinical reasoning in a given circumstance. In the multiple studies under reflection we found that the clinical thinking strategies are inherent, a vast and complex, articulation of different components such as professional skills, personal characteristics, client characteristics, working conditions, environmental conditions and continuous training, which the nurse adapts and uses to build clinical reasoning and to implement nursing interventions. This complex and responsible action of the nurse aims to systematically achieve the client's and family's well-being and to correspond to the organizational objectives of the institution where they perform their functions.

CONCLUSIONS

Clinical reasoning strategies of nurses who take care of critically ill clients are a set of tools that the nurse uses to construct clinical reasoning in relation to a given circumstance. These strategies underly a repertoire of professional skills and personal characteristics that allow them to develop their professional action, such as professional skills (relational skills, communicational, emotional, negotiation and commitment), professional experience and personal characteristics. These strategies seem to be structuring to the nursing exercise, since they contribute to the collection and selection of the information with the client and family. It should be noted that the selection of nursing strategies is influenced by a set of factors such as client characteristics, nurse characteristics and context (environment, multidisciplinary team and structure).

From this reflection emerges the nurse's ability to establish a relationship of trust with the client in a short space of time, developing negotiation skills and commitment in order to involve him in clinical decisions. Regarding the collection of information it is innovative and dynamic in the databases querying, in the bibliographic research and, it bases knowledge on scientific evidence with the ambition to respond quickly and efficiently to the needs of the client. However, contextual conditions influence their clinical thinking and decision-making capacity, such as fatigue, low autonomy and workload, these circumstances may lead nurses to less coherent decisions causing them to feelings of anguish and regret. This systematic literature review allowed us to identify clinical reasoning strategies, but the clinical reasoning process seems unclear, so it seems important to deepen knowledge about the nurses' clinical reasoning process, promoting better results from autonomous intervention and nursing decision-making. This systematic literature review did not answer the following questions: How is the process of clinical reasoning developed? What information do the nurses collect at the first meeting? What data support immediate decision-making in critical situations?

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