

REVIEW ARTICLE

A LITERATURE REVIEW IN TRIAGE DECISION MAKING: SUPPORTING NOVICE NURSES IN DEVELOPING THEIR EXPERTISE

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Abstract

Emergency nurses often find themselves doing triage under time pressure and with only limited information, while the accuracy and rapidity of triage assessment may well determine a patient's safety. A question may emerge as to whether novice nurses, who may have lack of experience and knowledge, could deal with such a demanding practice. In response to this, equipping novice nurses with important aspects in triage decision-making processes is pivotal. The aim of this literature review is to identify elements that could be utilised as supports for novice nurses in developing their expertise of making decision in triage. This study employed CINAHL, ScienceDirect, and PsycINFO to find relevant articles, using search terms "triage", "decision-making", "clinical decision-making", combined with "expert", and "novice". The publication dates of those articles ranged from 1990 to 2015. 1487 articles was found and sorted based on inclusion and exclusion criteria, resulting in seventeen articles that had been used in this study. Literature review suggests four important elements for developing novices' expertise in triage decision making: understanding the difference of novices' and experts' performance, critical analysis on theoretical approaches of clinical decision-making processes, defining factors that may influence nurses' triage decision making, and using appropriate learning strategies.

KEYWORDS

triage decision making; novices' decision making; experts' decision making

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INTRODUCTION

Overcrowding in hospital emergency departments has been a challenge for nurses who are trying to provide a high quality of care for patients (Noon, 2014). To face this challenge, the sorting of patients is important (Marsden, 2008). The sorting of patients based on their acuity and the decision that prioritises one patient over another is defined as triage (Marsden, 2008), while the process of assessing patients to make a triage decision is called triage decision making.

Emergency nurses often find themselves doing triage under time pressure and with only limited information (Reay & Rankin, 2013). For example, nurses should determine patient's acuity in no more than twenty minutes and also make a

justifiable referral in a short time, as there are likely to be many patients waiting to be seen and triaged. Therefore, identifying an effective clinical decision making process in triage is a considerable aspect in promoting patient safety. Since the accuracy and rapidity of triage assessment may well determine a patient's safety (Cioffi, 1998), a question may emerge as to whether novice nurses, who may have lack of experience and knowledge, could deal with such a demanding practice.

A novice is not only defined as a person who does not have experience, but it can also be a person who has years of experience in a particular area, yet become novice again when she/he encounters a completely different area and different level

of knowledge (Benner, 1984). In other words, the concept of novice is context specific. Identifying elements that may assist novice nurses in dealing with high demand areas of practice, such as acute or emergency care is imperative since the number of expert nurses may well decrease as they reach retirement age (Ebright et al., 2004). To support novices in learning triage decision making processes, the possible attempts are to equip them with important elements in triage decision making, so that they may critically look at that elements and find attempts to develop their expertise. The aim of this study was to identify and to discuss important elements that can be utilised as supports for novice nurses for developing their expertise in triage decision making.

DATA SOURCES

This was a literature review focused on triage decision making done by nurses. CINAHL, Science Direct, and PsycINFO had been utilised to find relevant articles around triage decision making. The article used in this study had to be published between 1990 – 2015, English language articles, articles from other discipline such as medicine and psychology that specifically discussed decision making, and articles that contain relevant theoretical framework for triage decision making or clinical decision making in general. The exclusion criteria applied in this study is article that discusses ‘Triage’ term in non-medical and/or non-nursing discipline.

1487 articles had been found using search terms “triage”, “decision making”, “clinical decision making”, combined with “expert” and “novice”. The duplicate were removed, and the articles had further been selected by reading them and sorting them based on the inclusion and exclusion criteria, resulting in seventeen articles that had been reviewed in this study. In addition, outdated literatures that provides relevant theoretical foundation had been used in this study. For example, article

from Benner and Tanner (1987) that discusses about how expert and novice using intuition in clinical decision making.

FINDINGS

Most of the articles that met inclusion and exclusion criteria and had been used in this review are exploratory research, either quantitative and qualitative study. The rest are review articles from Noon (2014), Smith et al. (2013), and theoretical critique (Standing, 2008). Four key findings of this review were: understanding novice and expert’s performance, critical analysis on theoretical approaches of clinical decision making processes, defining factors that may influence nurses’ triage decision making, and utilising appropriate triage learning strategies.

Clinical decision making by experts and novices: the differences

The difference between novices’ and experts’ or experienced nurses’ performance in triage decision making is essentials to gain understanding the strength and weakness of both performance. Schubert et al. (2013) argued that by learning the differences between novices and experts is necessary to develop effective instructional modalities that can help in speeding up the learning process of inexperienced physicians especially those who work in high complexity environments.

A qualitative exploration by Schubert et al. (2013) demonstrated that expert clinicians were identified as using macro cognition, in which they regard several factors such as new information, environment, and organisational factors embedded in the clinical decision making process. In contrast, novices may use micro cognition, which largely relies on objective data (Schubert et al., 2013).

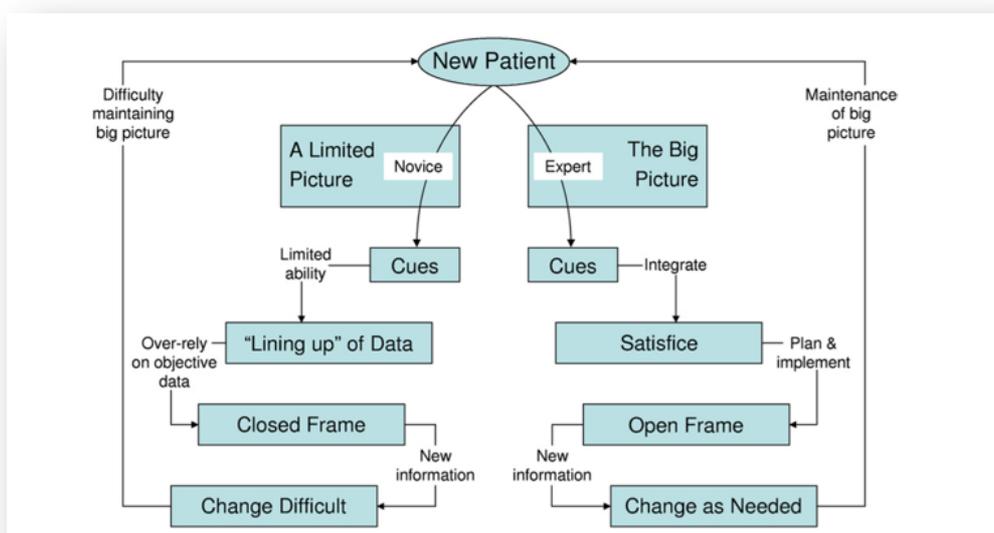


Figure 1 Novice-Expert Differences in Clinical Decision Making (Schubert et al., 2013)

Some researchers argue that experts can and do perform clinical decision making more effectively than novices. As novices have less years of experience in particular areas and may have not done sufficient preparation, they may be prone to make errors (Saintsing et al., 2011). Aligned with this argument, a study conducted by Martins et al. (2012) demonstrated that clinicians, who have less than ten year experience, seem to make more errors than those who have greater experience. It may be because more experienced nurses may have developed a heightened sense of awareness (Benner, 1984), and have collected more cues than novices (Hoffman et al., 2009). Furthermore, the experienced nurses seem to be more proactive in using these cues to perform clinical decision making skills (Hoffman et al., 2009). Therefore, experts' decision may be more accurate than novices'.

In addition, Cioffi (1998) demonstrated that experienced nurses were more definite and immediate in their decision regarding particular cases and defining clinical judgements although

novices seem to collect more information. For example, if novices concentrate their minds in learning how to assess pain, they might collect more information about pain. However, they might not notice that the patient they are assessing is having abnormal pulse rhythm. Thus, may lead to losing the 'big picture' of patient's condition (Ebright et al., 2004) which, in turn, may reduce their clinical decision making accuracy. This is align with Cone's finding where expert nurses have higher mean scores on triage decision making ability than novices (Cone, 2000).

Critical analysis on theoretical approaches of clinical decision making processes

Triage was firstly performed by Baron dominique Jean Larre in 1840 (Fry & Burr, 2002), who prioritised medical needs of the military in Napoleonic War (Marsden, 2008). Since the late 1970 and early 1980 this strategy has been developing in hospital emergency departments worldwide (Fry & Burr, 2002). An overview of triage process is presented in Table 1.

Table 1 Triage Roles (Fry & Burr, 2002)

Triage Roles
1. Investigation of patient's condition (physiological examination, gathering subjective data)
2. Code allocation (validating data, making judgement, determining severity, prioritize a patient over another)
3. Referral (to home/hospital/other health services)
4. Treatment (determining treatment based on patient's severity)
5. Non-patient tasks (communication, administration)

Triage is conducted via both structured and unstructured methods (Smith, 2013) since there are triage protocols and triage acuity scale that may help nurses in making triage decision. The triage protocols are present to aid prioritisation and rapid process of information and pattern recognition, which could be either minimally structured and unstructured (Marsden, 2008), whereas the triage acuity scales aid triage nurses to prioritise patient's acuity. The most well accepted triage acuity scales are Manchester Triage System, the Australasian Triage Scale, Canada Triage and Acuity Scale, and the emergency Severity Index Triage Scale (Marsden, 2008). It could be asked that how triage nurses implement those protocols/scales in triage decision making? When triaging, nurses generate assessment results and other factors into judgement and decision.

It is important that triage nurses should have the ability to determine whether they face a static or dynamic situation when generating their judgement into a decision (Noon, 2014). Nurses often face a dynamic situation while triaging (Noon, 2014); for example, a patient complaining dyspnea and chest pain may be more prioritized than a patient suffering abdominal pain and nausea. However, if the patient with chest pain had not presented, then the prioritization may be different (Noon, 2014). In such a dynamic situation, the type of judgement can be a dynamic judgement, where its goal is predicting the possible changes (Maule, 2001). Thus, Noon (2014) suggested that assessing theoretical arguments of clinical judgement and decision making which may be adopted in triage decision

making is important. Several decision making theories has been assessed and presented as follows:

Hypothetico-deductive model

Göransson et al. (2008) conducted a study which demonstrated that registered nurses who work in emergency departments (n=16) adopt several thinking strategies which correspond with a hypothetico-deductive approach, which was defined by Elstein and Schwarz (2002). This approach is focused on information processing sequences (Table 2).

Table 2 Hypothetico-deductive model (Elstein & Schwarz, 2002)

Hypothetico-deductive model
1. Cue acquisition
2. Hypothesis generation, based on gathered data
3. Cue interpretation, choosing one alternative based on evidence

The hypothetico-deductive approach in triage decision making was found to be done by all participants, regardless of their years of experience in practice (Göransson et al., 2008). The participants did all the sequences presented in Table 2. However, this study was not conducted in an actual triage situation and using case-based scenarios instead. Therefore, the actual triage in emergency department where the situation is dynamic may not be depicted clearly by those scenarios. Paley (2006) argued that such an approach seems to be unrealistic to be implemented in real life decision making.

Dual system theory of clinical decision making

Croskerry (2009) assessed the dual process theory of clinical decision making, which has been identified as System 1 and System 2. System 1 represents intuitive decision making, which is fast and highly automatic, and the typical of decision done by experts (Croskerry & Nimmo, 2011). System 2 represents an analytical process which is slower but highly consistent (Croskerry & Nimmo, 2011) in which novices have been identified using this strategy (Benner & Tanner, 1987). Intuition is defined as “understanding without a rationale” (Benner & Tanner, 1987), whereas the analytical process involves deliberation and data analysis (Croskerry, 2009).

The use of triage protocols and scale may assist decision-making in System 2. Most errors identified as cognitive biases (Croskerry, 2006), occurs in System 1 as the consequences of the human tendency to have prejudice (Croskerry, 2009). Intuition has also been reported to be adopted by triage nurses despite utilizing triage protocols and physiologic data (Ek & Svedlund, 2015; Wolf, 2010). As triage should be implemented in a very short time, expert nurses may benefit from using intuition, since they may have recognized what would happen to patients, even if they had not exhibited signs and symptoms causing concern (Benner, 1984).

But what if novices followed their intuition? Some researchers argue it could be harmful if done by novices since they may lacking in experience and knowledge (Croskerry, 2006) and may not have sufficient knowledge to weigh the cues being presented (Thompson & Dowding, 2002). Therefore, the relevance of System 2 could not be disregarded, since it provides analytical deliberation towards a decision, therefore it

may help to reduce errors (Croskerry, 2006). However, using analytical way in every triage process may be time consuming, while triage should be done in a very limited time (Reay & Rankin, 2013). Therefore, it is important to note that nurses should be aware of when exactly they could adopt intuitive and analytic decision-making. Croskerry (2013a) suggests that habitual reflection and analysis towards clinicians’ decision making may help experts to gain insight and analyze their decision. It may also encourage novices to learn decision-making process in triage.

The cognitive continuum theory

Triage may be done in a poorly structured task, with low control over the variables such as signs, symptoms, time, and professional capability (Noon, 2014). On the other hand, evidence-based practice has been adopted in triage decision-making, such as the utilization of triage protocols and triage acuity scale. Therefore, the cognitive continuum and its revision by Standing (2008) may contribute to nurses’ understanding towards triage decision making.

This theory looks at decision situation with range from poorly structured tasks to highly structured tasks, included further cognitive process between these two (see Figure 2). For example, a reflective judgment may be done by nurses in order to gain insight over their previous experiences and decisions, so that they could analyze what may be wrong or right and prepare for better practice (Standing, 2008). Moreover, a system aided judgment may represent the use of the triage protocols in gathering data to be generated to judgment and triage decision (Noon, 2014).

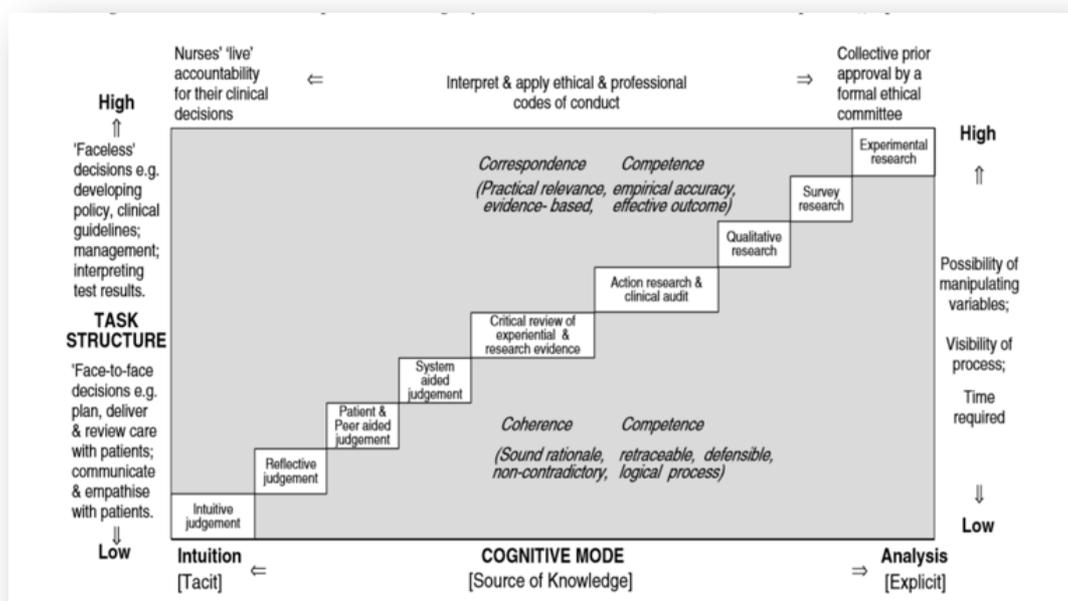


Figure 2 Standing’s revised continuum theory (Standing, 2008)

[Gertz and Bucknall \(1999\)](#) suggested that the adaptation of research evidence in triage decision making is imperative since triage nurses often have to make autonomous decisions. As an example of autonomous decision, triage nurses work in separate room, determine patient's acuity by themselves, and have autonomy to make referral. Such responsibilities require triage nurses to adopt relevance evidence from nursing research in order to make them accountable ([Gertz & Bucknall, 1999](#)).

Factors that may influence nurses' triage decision-making

There are several factors that may influence nurses' triage decision-making as follow:

Knowledge and experience

[Croskerry \(2009\)](#) suggested that "all decisions are made in some sort of context", therefore clinicians' decision making may be influenced by such contextual factors. [Gertz and Bucknall \(2001\)](#) found several factors which significantly influenced the time-length of triage. These factors were categorized into: patient, nurse, and environmental factors. Looking specifically in nurses' factors, this study found that nurses used minimal objective data to determine level of urgency because physical assessment may increase time-length of triage ([Gertz & Bucknall, 2001](#)). A similar finding has previously been revealed by [Salk et al. \(1998\)](#) who found that nurses tended to use visual cues rather than vital signs during triaging. It seems that despite using triage assessment, nurses rely on their previous experience in assessing patients in order to reduce triage time-length.

[Gertz and Bucknall \(2001\)](#) demonstrated that nurses, who have more or longer experience need less time in assessing a patient than do nurses who have less experience in an emergency department; however, this result was not statistically significant ($t=0.67, p=0.23$). This result is similar with a previous study ([Walsh, 1991](#)) which demonstrated that years in practice had an insignificant influence on nurses' prioritization. Moreover, experienced nurses may vary in assigning standardized triage protocols ([Fields et al., 2009](#)), which could indicate that years in practice may have an inconsistent influence in nurses' triage accuracy ([Dallaire et al., 2012](#); [Parenti et al., 2006](#)). [Cioffi \(1999\)](#) emphasized that relying solely on previous experience may lead to devaluing objective data and other explicit evidence.

[Considine et al. \(2007\)](#) suggested factual knowledge, which is identified as knowledge generated from fact, has greater impact on triage decision making than a nurse's years in practice. It means that nurses, who gain the whole picture of patient's actual condition, may perform more effective triage decision. However, the terms of factual knowledge and knowledge derived from experience are interlinked ([Considine et al., 2007](#)). It could be suggested that both knowledge and experience have an important role in clinical decision-making ([Cioffi, 1999](#)).

In addition, individual knowledge and experience embodied in personal capacity has been regarded as one of the most important components in triage decision making, since an

advanced protocol may be meaningless if the individual does not have sufficient capacity to implement it ([Andersson et al., 2006](#)).

Environment, communication, and ethics

The other factor that has been identified as having influence on triage decision-making is the work environment ([Andersson et al., 2006](#); [Gertz & Bucknall, 2001](#); [Standing, 2008](#)). For example, nurses regard the high workload in an emergency department as a factor that may negatively influence their triage accuracy. Moreover, time pressure was also reported to be negatively affecting nurses' decision performance ([Ebright et al., 2004](#); [Thompson et al., 2008](#)).

Align with this, [Wolf \(2013\)](#) suggests a framework where integration between personal capacity, ethical consideration, and environment may influence nurses' triage decisions. Based on this framework, it seems that triage is not as simple as sorting patients based on their acuity, but it does involve those factors in decision-making process. As an example of interaction between these factors, nurses may lack confidence in their actions because they are concerned about being judged by patient or other nurses ([Cioffi, 1998](#)). This may lead them to make a safe decision, although it may not match with their clinical judgment ([Ek & Svedlund, 2015](#)).

Moreover, when nurses have to decide which patients might need immediate treatment in the emergency department, they need to communicate with patients or their family to gather subjective data. They must also be fully aware of the number of beds available and how many health personnel they can call upon. Therefore, communication between triage nurses and other staff in a hospital's emergency department should be established effectively ([Epstein, 2013](#)).

Utilizing appropriate learning strategies

Several strategies have been recommended by researchers in order to enhance clinical decision-making ability in nursing students and novices. [Ebright et al. \(2004\)](#) assessed that time pressure may negatively influence the quality of novices' decision making, since they might feel that they have no time to think of all they have to do. Therefore, experienced nurses need to educate novices in such situations, by mentoring or escorting novices when making a decision ([Ebright et al., 2004](#)). It is suggested that supervised practice by expert triage nurses may enhance novices' confidence and competence in triage decision making ([Innes et al., 2011](#)). Whenever possible, having a reflective session after the decision has been made is advantageous, in order to prevent biases and to justify and clarify the decision ([Croskerry, 2013b](#); [Schubert et al., 2013](#)). It may also equip novices with a viable skill set for assessing and recognizing patient's conditions by reflecting upon their action ([Bakalis & Watson, 2005](#)), based upon the assumption that the expert nurses' abilities in triage decision making could be transferrable to novice recipients.

Other learning strategies suggested from the review is simulation ([Cioffi, 1998](#); [Schubert et al., 2013](#)). Simulation may provide a 'real world' picture of triage. A study conducted

by [Smith et al. \(2013\)](#) indicated that the use of simulation could promote senior nursing students' confidence in performing triage decision making. However, the number of participants in this study was small (n=14) so that it could not be generalized. [Wolf \(2013\)](#) argued that observation towards actual triage decision making is more effective rather than adopting case studies. It can also be argued that simulation may be costly and cannot completely depict real triage practice in a dynamic emergency department.

In addition, [Spivak et al. \(2011\)](#) suggested that leadership in work may contribute to developing novices' expertise; for example, the sharing of encouragement and support from nurse leaders to other nurses may help the latter to deal with the complex transition process from novice to expert.

CONCLUSION

It can be seen that triage decision-making in an emergency department may not be as simple as sorting patients based on their acuity. Triage has been performed in conditions of extreme time pressure, high workload, and also in dynamic and complex situations. Nurses also have to perform effective communication with other team members in emergency department, considering resources availability, and their own personal capability. It can be a challenge for both novices and experts in dealing with such demands.

Understanding the difference between novices and experts performance may help novices to learn from both their strength and weaknesses. Several theoretical approaches may be considered to aid nurses to understand and perhaps enhance their triage decision-making abilities. It is important to note that the application of those theories may depend on their context and cannot be applied universally. Factors that may influence nurses' decision-making ability have also been addressed in this review. Novices should develop their sense of awareness towards those factors. Finally, recommended learning strategies that can be used to improve novices' triage decision-making ability have also been presented in this study.

Declaration of Conflicting Interests

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