Spring 4-30-2022

An Educational Intervention to Improve Nurses' Knowledge and Self-Confidence: An Integrated Literature Review

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Abstract

Purpose: To provide educational intervention to improve the knowledge and self-confidence of nurses in ambulatory and urgent care clinics in detecting early deterioration, intervening, and evaluating changes in patient condition using a consistent assessment tool. A review of the organization policy indicated a process to call the medical alert response team (MAR). However, there was no established algorithm for nurses to escalate or implement interventions when they noticed a patient condition change. An informal survey of ten assistant nurse managers in the ambulatory and urgent care clinics asked about their calling process for MAR and what interventions are used yielded inconsistent practices across the board. An unofficial survey of clinic nurses suggested a lack of knowledge and self-confidence in nurses for recognizing and implementing appropriate intervention when there is a change in patient condition.

Method: Extensive literature search using CINAHL and PubMed databases for peer-reviewed articles relevant to the topic.

Results: An educational intervention that enhances nurses' knowledge and self-confidence in recognizing and activating appropriate intervention empowers nurses to utilize critical thinking and clinical judgment to provide high quality and safe care to their patients, thus decreasing failure to resuscitate.

Conclusions and Implications to practice: There is a need to provide educational intervention to improve the knowledge and self-confidence of nurses in ambulatory and urgent care clinics in detecting early deterioration, intervening, and evaluating changes in patient condition using a consistent assessment tool.

Keywords: Educational intervention, nurse's knowledge, self-confidence, low fidelity simulation, modified early warning score, outpatient.

Introduction and Background

Patient safety forms the foundation of healthcare delivery as patients' biological, physiological, and safety needs depend on clinicians' knowledge, skills, and attitudes. The 1999 Institute of Medicine (IOM) report highlighted the need for improved quality of healthcare delivery, thereby bringing patient safety to the forefront in health care. Over the decades, the IOM report on To Err is Human: Building a Safer Health System and the follow-up report, Crossing the Quality Chasm brought attention to health care professionals on the safety of patients and the quality of care provided to improve patient outcomes [1, 2]. Patients' safety involves sets of organized influences such as cultures, processes, behaviors, technologies, and healthcare environments in reducing risks, avoidable incidents, and impact on patients, employees, and the organization [3]. Thus, given the challenges from the aforementioned influences faced by the nurses and support staff in outpatient settings, creating a culture of nourishing educational opportunities to enhance their knowledge, competencies, and self-confidence for the utmost goal of positive patient outcomes and experiences is imperative.

Institute of Medicine (IOM), Crossing the Quality Chasm Committee, established six aims for patient care improvement that have guided health care systems in the quality and safety of patients entrusted in their care. The six aims are safe, effective, patient-centered, timely, efficient, and equitable care [1]. Each of these aims contributes to the quality and safety of care provided to a patient and meets the patient's needs. The Quality and Safety Education for Nurses (QSEN) faculty understand the challenge's enormity, empowering nurses to transform healthcare and improve the quality of care and patient safety. The QSEN aim is to transform healthcare into reducing preventable harm to patients and improving the competencies of the workforce [4]. So, providing an educational intervention that focuses on improving nurses' education and self-

confidence is part of a system process to empower nurses to improve the quality and safe care they provide to a patient.

In a non-profit local government-run organization's outpatient clinics, inadequate staffing is a big challenge that impacts the workflow, safe care processes, and quality of care nurses deliver. Consequently, most of the direct patient care in the outpatient clinics is performed by the support staff, Licensed Vocational Nurses (LVNs), and Medical Assistants (MAs). Whereas the limited Registered Nurses (RNs) in the outpatient clinics focus their time on patient care coordination, patient education, triaging, and responding to patient messages and medical emergencies. The staffing challenge presents an opportunity for nursing staff knowledge and self-confidence-based quality improvement educational intervention in the outpatient setting.

Teaching nurses through simulations or case scenarios reflect on and unfold cases to apply knowledge, recall previous experiences, and examine the impact of a decision on a patient [4]. Knowledge begets awareness of a situation and self-confidence. A recent code blue at a local government outpatient clinic highlighted the importance of developing and implementing an educational intervention that would include RNs and other support staff (LVNs and MAs). During the code blue situation, the support staff showed poor knowledge and self-confidence in noticing, activating, and responding appropriately to the interventions. Hence, it prompted the need for educational intervention that improves nurses' knowledge and self-confidence and improves awareness of patients' conditions, especially in real-time. Recognition of subtle signs and symptoms of deterioration in patient conditions and activation of appropriate intervention is critical in improving patient outcomes [5].

Several authors have validated the importance of the early warning score (EWS) tool to assist nurses in recognizing and intervening appropriately when a patient's condition

deteriorates. Early Warning Score (EWS) is an assessment tool that supports nurses in early recognition of change or deterioration in patient condition and promptly initiating appropriate intervention or communicating the change to the physician [6]. EWS assessment data could be vital signs, urine output, level of consciousness, oxygen saturation, and any other vital objective monitoring data the patient care team is collecting on the patient to make an informed clinical decision. However, Modified Early Warning Score (MEWS) adapts the EWS to suit a particular patient care unit or specialty based on the level of care and resources available to monitor the patient and collect the information. In their systematic review, [7] and [8], in their scoping review, concluded that using EWS by nurses ensures patient safety and improves outcomes. [8] suggested that nurses rely on the data they extract from the EWS system to decide on intervention.

Educating and empowering the RNs and the support staff to recognize abnormal vital signs or changes in patient conditions and activate appropriate responses is critical in improving patient outcomes in outpatient clinics. Therefore, developing an educational intervention system that endows nurses, including the support staff, with the knowledge, self-confidence, and assessment tools to provide high-quality and safe care. Support staffs and RNs are the backbones of care delivery in outpatient settings [9]. As a result, understanding their challenges, work relationships, and knowledge gaps and implementing an educational intervention to promote their knowledge, skills, self-confidence, and enhanced teamwork is essential in optimizing patient care delivery and outcomes.

Norris et al. [10] identified barriers that hinder nurses in activating appropriate intervention when there is a deterioration in patient condition. Some barriers identified by [10] include lack of nurses' knowledge, self-confidence, insufficient monitoring of vital signs,

infective communication, overreliance on notification of a provider first, lack of education, appropriate training, the disparity in shared decision, ownership, and individual responsibility. Their integrative literature review, [11] identified patient assessment, patient knowledge, nurse education, and equipment as factors that impede nurses' recognition of patient deterioration.

Thus, the use of algorithms enhances the nurse's ability for efficient and holistic assessment in the early detection of patient deterioration and appropriate intervention [8]. The study by [12] suggested that a modified early warning score (MEWS) is a helpful tool in predicting patient deterioration and the need for admission from an emergency room. Although the MEWS was developed for the inpatient setting, MEWS can be calculated from the available vital signs in the emergency room or outpatient setting to make a clinical decision and a point of reference compared to the efficacy of an intervention [12].

Theoretical Framework

Tanner's Clinical Judgment Model (Tanner's Model) of noticing, interpreting, responding, and reflecting is a theoretical framework that aligns with the nursing process of assessment, diagnosis, planning, implementation, and evaluation [13]. Nursing care of a patient involves assessing the patient situation, nursing diagnosis, planning of nursing intervention, implementation of an intervention, and finally, evaluation of the intervention that was implemented. Tanner's Model of noticing, interpreting, responding, and reflecting mirrors the nursing process concept. Thus, using the concepts nurses are familiar with is imperative to drive nursing training.

Hanley et al. [14] used three concepts of Tanner's Model of Noticing, Interpreting, and Responding in clinical practice in their quality improvement process to improve patient safety by teaching the nurses how to operationalize in clinical practice. [15] Tanner's clinical judgment

model in a high-fidelity simulation scenario for undergraduate nursing students to manage a patient with gastrointestinal bleeding. The result showed a significant increase in the students' theoretical knowledge, clinical performance skills, and self-confidence [15].

Failure to recognize a change in patient condition or deterioration could lead to failure to rescue. Improving nurses' ability to quickly recognize changes and apply appropriate intervention improves patients' chance of positive outcomes. The development of case scenarios based on the clinical judgment model and evaluation of nurses' clinical judgment during simulation practice will help construct a meaningful simulation experience that could impact nurses' care delivery [15]. Using Tanner's Clinical Judgment Model, the nurse would recognize the decline in patient condition, interpret the change, implement an intervention, and reflect on the outcomes on whether the interventions were effective.

Methods

Integrated Literature Review

This literature review is aimed to gather evidence to support educational intervention for nurses using standardized modified early warning score (MEWS) and low fidelity simulation or case scenarios to improve nurses' knowledge and self-confidence. An extensive literature search through CINAHL and PubMed databases for peer review articles were done. An Initial search with CINAHL with a search limit under ten years for a Modified Early Warning Score yielded 201. However, when the search was limited to pre-hospital, the yield was seven. A search through PubMed yields 387 articles. However, a search limited to pre-hospital and outpatient on Early Warning Score and ambulatory reduced the yield to thirty-seven. Furthermore, this number fell to ten when limited to the Modified Early Warning Score. The Johns Hopkins Nursing

Evidence-Based Practice (JHNEBP) tools were used to appraise each piece of evidence for its level and quality.

Alam et al. [16] conducted a systematic review of seven articles to assess the impact of EWS and MEWS combined with or without an outreach service on a particular patient outcome. The authors found a positive result from the study towards the trend in using MEWS and EWS helps nurses recognize patients with the potential to deteriorate. In addition, EWS may be used to initiate treatment promptly, which could affect patient outcomes.

Burger et al. [17] used a mixed-method study to develop and validate a modified situation, background, assessment, and recommendation (SBAR) communication tool integrating components of Cape Town MEWS to score vital signs for reporting early signs of clinical decline in patient condition. This study was the first modified early warning score linked to situation, background, assessment, and recommendation (SBAR) communication. The tool was validated and found to be reliable. Although MEWS is a vital assessment tool in recognizing deterioration in patient conditions, [17] recommend that it cannot be substituted for clinical judgment. Even though it was single-site research, the SBAR communication tool linked with MEWS improved communication among clinicians. Hence, effective and accurate communication between nurses and other healthcare clinicians is imperative in the patient care and may impact patient outcomes. Therefore, incorporating an assessment tool with a communication tool allows the nurse to communicate a patient's vital information to the provider effectively.

Dalton et al.'s [18] qualitative study suggests that nurses' knowledge based on instinct influences the nurse's assessment of changes in patient condition. Nevertheless, the nurse's knowledge of the patient and the nurse's intuition are critical in detecting the subtle differences

in the patient's condition [18]. At times known as "gut feeling," intuition is a process based on knowledge and experience nurses integrate with analyzing and synthesizing objective data when making clinical practice decisions [19]. A nurse's intuition is a unique ability for the nurse to connect past knowledge and experiences and uses it to connect with the present situation. Often, the nurse's sense of knowing, coupled with past experiences, impacts their ability to recognize and manage a patient's change in condition. Although nurses may find intuition challenging, they still lean towards it when appraising a critical patient care situation [18]. The study emphasized the importance of nurses using MEWS to assess and escalate the patient situation. The integrative review by [11] noted the complexity and multifaceted nature of recognizing and managing deteriorating patients. Thus, making it essential for nurses to combine intuition, objective vital signs, and clinical judgment when assessing a deteriorating patient.

Hanley et al. [14] retrospectively reviewed and identified strategies to enhance nurses' clinical judgment by developing and adopting an early warning score system. Their findings include delays in recognizing changes in patient condition promptly, interpreting the implications of the changes, and intervening appropriately [14]. In addition, they attribute a lack of critical thinking to the breakdown of care. Their finding led to a quality improvement project that improved nurses' confidence in recognizing deterioration and providing objective data to the provider, improved clinicians' communication, and decreased inconsistency in patient assessment, interpretation, and response to changes in patient condition. Decisions made on objective data derived from EWS, such as abnormal vital signs or changes in the level of consciousness, offers the nurse the opportunity to be proactive and deliberate with communication with the medical alert response team or provider and intervention provided [14].

[14] concluded that Early Warning Scoring (EWS), by providing objective trends in vital signs, impacted nurses' way of communication, assessment and interpretation skill, and confidence.

A quality improvement study by Lee et al. [5] suggests that nurses felt more confident in their knowledge, skills, and ability to recognize and activate intervention after attending a simulation educational intervention. Using simulation in educational intervention and incorporating specialty-specific scenarios allow nurses to improve teamwork, communication, and critical thinking in an environment familiar to them [5]. Scaramuzzo et al. [20] and Elder [21] also reported improving nurses' knowledge, self-confidence, and competencies after completing educational intervention using simulation.

Ludikhuize et al. [22] conducted a quasi-experimental study on the effect of protocolized measurement (three times daily) of the Modified Early Warning Score (MEWS) vital signs versus measuring when clinically indicated. The study suggested that recording comprehensive sets of vital signs and MEWS three times per day resulted in better recognition of physiological deviations, a substantial rise in call-out rates, and more consistent activation of the rapid response team, thereby providing an opportunity to avoid adverse effects. Although in the outpatient setting, most deteriorating patients are transferred to a higher level of care as soon as paramedics arrive or when they are stable enough to transport. Irrespective of the patient's length of stay in the clinic, the patient should be under constant observation by a nurse and objective assessment data collected, recorded, and appropriate interventions applied.

Norris et al. [10] suggested that nurses who participated in patient rescue educational intervention competency showed improved knowledge and self-confidence in recognizing and activating appropriate responses after the educational intervention. By investing in patient deterioration simulation educational intervention for nurses, nurses demonstrated competency

and self-confidence in managing patient deterioration [10]. Joho et al. [23] also support that improving nurses' knowledge, skills and self-confidence is vital in improving patient outcomes.

Parker [24] conducted a descriptive, cross-sectional, correlational study to ascertain the correlation between nurses' decision-making and rapid response team (RRT) calls. The study suggested that analytical decision-making appeared to correlate with an increase in the frequency of RRT activation. Hence, timely recognition of patient deterioration prompts the nurse to activate appropriate intervention such as early communication with the provider or calling RRT, code blue, or 911. An increase in activation of RRT is related to a decrease in in-hospital mortality rate because monitoring and early detection of patient deterioration is the first step [24] to achieving patient safety and positive outcomes. Therefore, early recognition of a patient's deterioration prompts a nurse to activate a medical alert response (MAR) team, or apply appropriate intervention, thereby impacting the patient outcome. [25] noted that effective activation of RRT/MAR could save lives. [24] highlighted the significance of nurses' knowledge, self-confidence, critical thinking, and clinical judgment while assessing, interpreting, and intervening when there is a change in patient condition. Collecting objective data from EWS or MEWS system is the first step in recognizing a change in patient condition. However, quickly interpreting the data collected and responding by calling MAR/RRT or notifying a provider impacts the patient's outcomes. The study also highlighted the role of nurses in surveillance and recognition of deterioration in patient conditions as initial steps for nurses in the promotion of safe care [24].

Smith et al. [6] conducted a systematic review searching for evidence to develop guidelines to develop and implement EWS at facilities within the Veterans Affairs system. The study suggested that the early warning scoring system performs well in forecasting death within

48 hours. The study also indicated that the implementation of EWS will increase the use of nursing staff in the clinical setting and increase the nurse's critical thinking, clinical judgment, and activation of the rapid response system. However, the effect on a patient's length of stay in the hospital or ICU remained uncertain. Even though this study was based on the inpatient setting, it showed the significance of EWS, which can be modified as MEWS tools suitable for use in an outpatient setting. In their systematic review, [8] suggested that nurses rely on the data they extract from the EWS system to decide on intervention.

Williams et al. [26] conducted a systematic review to examine whether early warning scores can predict critical illness in the prehospital setting and affect patient outcomes. The study concluded that early warning scores in the prehospital setting appeared helpful in predicting significant changes in patient condition and outcomes. Despite the pre-hospital setting challenges, such as patients presenting with non-specific signs and symptoms, and limited diagnostic tests, EWS is critical in its predictive accuracy, clinical utilities, and general ability when used in conjunction with clinical judgment [26]. [27] Their systematic review reported prehospital use of EWS and demonstrated that EWS can be successfully used in predicting deterioration in patients in a prehospital setting. Using the data extracted from EWS helps recognize the patients' deterioration and is significant in assisting decision-making that impacts the outcomes of the patient [27]. Although [26] noted that an ideal EWS in prehospital should have high sensitivity and be specific with data. Langkjaer et al. [28], in their qualitative exploratory design, noted the complexity of identifying patient deterioration by nurses. in addition, nurses find EWS meaningful in identifying patient deterioration. They concluded that clinical assessment and data collected from EWS should be weighed equally high. Otherwise, if both are neglected, it could impact patient safety and outcomes [28].

Table 1: Integrated Literature Review Evidence Table			
Authors	Types of studies	Focus of study	Findings
Alam et al. (2014)	Systematic Review	EWS in hospital setting	Positive trend towards better clinical outcomes after introduction of an EWS system.
Burger et al. (2017)	Mixed-method Study	MEWS with SBAR tool	Improved communication with clinicians.
Dalton et al. (2018)	Qualitative Study	Nurses' assessment and response with MEWS	Identified factors that influences nurses critical thinking and clinical judgement.
Hanley et al. (2016)	Retrospective Quality Improvement	EWS and nurses' clinical judgement	Improved communication and decreased variation in assessment and interpretation of patient status.
Lee et al. (2019)	A Quality Improvement Program	Simulation, scenarios	Simulation and scenario beneficial to nurses' learning and knowledge.
Ludikhuize et al. (2014)	Quasi-experimental	MEWS	Recording of comprehensive sets of vital signs and MEWS three times per day resulted in better recognition of physiological deviations, a substantial rise in call-out rates, and more consistent activation of the rapid response team, thereby providing an opportunity to avoid adverse effects.
Norris et al. (2019)	Experimental Quantitative	Education training with Simulation	Showed competency during patient deterioration.
Parker (2014)	A Descriptive, Cross-Sectional, Correlational Study	Ascertaining of the correlation between nurses' decision-making and rapid response team (RRT) calls.	The study suggested that analytical decision-making appeared to correlate with an increase in the frequency of RRT activation.
Smith et al. (2014)	Systematic Review	EWS	EWS results in increased number of activation of codes and RRT.

Williams et al. (2016)	Systematic Review	Prehospital EWS	The systematic review was unable to determine if the use of EWS in the prehospital setting improved patient outcome as none of the studied in included in the review directly compared the effectiveness of an EWS with clinical judgment in improving patient outcomes

Table 2: John Hopkins Nursing Evidence-Based Practice Appraisal (JHNEBP)

Authors	Strength of Evidence	Quality Rating
Alam et al. (2014)	Systematic Review - I	A
Burger et al. (2017)	Mixed-Method Design – Level III	B
Dalton et al.'s (2018)	Qualitative - Level III	A/B
Hanley et al. (2016)	Quality Improvement - Level V	A
Lee et al. (2019)	Project Development – Level V	A
Ludikhuize et al. (2014)	Qualitative Exploratory Design – Level III	A/B
Norris et al. (2019)	Experimental Quantitative – Level II	B
Parker (2014)	Descriptive Cross-sectional correctional quantitative – Level III	B
Smith et al. (2014)	Systematic Review – Level I	A
Williams et al. (2016)	Systematic Review – Level II	A

Results

Through educational intervention using a standardized assessment tool, nurses in outpatient clinics will have the enhanced knowledge to recognize abnormal vital signs, change in patient condition, and confidence to activate appropriate intervention, thereby reducing failure to

rescue and improving patient outcomes. Incorporating MEWS with low fidelity simulation or case scenarios in educational intervention for nurses has improved individual nurses' ability to recognize early changes in patient condition, collect and interpret objective data, and communicate effectively with the care team in real-life situations.

Discussion

The literature review aims to develop an educational intervention using MEWS to enhance nurses' knowledge and self-confidence. Due to the unpredictability of patient conditions and constant change in care delivery, nurses and support staff need adequate preparation and education to recognize and intervene appropriately when there is a change in patient condition [29]. The preponderance of literature review has shown evidence that educational interventions such as low fidelity simulation or case scenarios help improve nurses' knowledge and self-confidence, thereby improving patient outcomes.

The studies reviewed indicated that educational intervention with modified early warning score tools enhances nurses' knowledge and self-confidence in detecting changes and deterioration in a patient, interpreting the changes, and promptly applying appropriate intervention. In addition, nurses could communicate changes in patient condition objectively to physicians and the RRT/MAR Team. Although most of the literature on MEWS reviewed was based on the inpatient setting, a search on prehospital settings yielded substantial results. Results also indicated that MEWS help nurses notice, interpret, and intervene appropriately. Implementing educational intervention with MEWS and standardizing the process across outpatient clinics will create a consistent workflow in practice for nurses within the organization. In addition, evidence suggests that integrating the situation, background, assessment,

recommendation (SBAR) communication tool may be beneficial to nurses to convey a patient's condition to the provider effectively [17].

Nurses in outpatient clinics knowledge and self-confidence with patients with exacerbated health conditions are limited. Hence, [20] emphasized the need for nurses in ambulatory clinics to be competent, knowledgeable, and confident and not be intimidated by patient deterioration as the sicker patients are coming to outpatient clinics. [5, 20, & 21] reported that simulation-based educational programs are beneficial to nurses as the teaching increases their knowledge, competency, and confidence. Therefore, developing an educational intervention that allows nurses to use low fidelity simulation or case scenarios with the MEWS tool to practice recognizing, responding, and activating appropriate intervention will enhance nurses' knowledge, competency, and self-esteem when dealing with actual patient deterioration. In addition, it provides a standardized assessment tool for nurses to detect early deterioration in patients and improve patient outcomes.

Recommendation

Nurses' primary roles include promoting quality and safe care to patients [30]. Early recognition and implementation of the appropriate intervention is the first step for nurses to maintain their role in patient safety [24]. Patient-centered care and improved patient outcome is the core purpose of the quality improvement project [31]. Preparing nurses to effectively recognize signs and symptoms of patient deterioration and activate appropriate intervention is significant in improving patient outcomes. In addition, education enhances nurses' knowledge, skills, and self-confidence and empowers them to utilize critical thinking and clinical judgment in recognizing and activating appropriate interventions during patient care. Thus, implementing an evidence-based educational intervention to improve nurses' knowledge and self-confidence is

essential in providing nurses with the required knowledge, attitude, and skills to provide high-quality and safe care to their patients. Even though most of the studies on MEWS were based on inpatient settings, MEWS can be modified to suit the situations in outpatient clinics [12]. More studies are needed to support the evidence that MEWS will positively impact nursing care in ambulatory and urgent care clinics. Incorporating low fidelity or case scenario educational intervention in annual nurses' competency training is recommended to continuously build on the knowledge, competency, and self-confidence nurses gained during their early training.

Conclusions

The ambulatory care nurses are not equipped with sufficient knowledge, self-confidence, and resources to manage patients with exacerbated health conditions. So therefore, these clinics have resorted to calling MAR or 911 when the patient's condition deteriorates. All the literature reviewed suggested that using MEWS helps nurses detect change or deterioration in patient condition, interpret changes in patient condition, and quickly implement an appropriate response. Even though most of the studies were based on the inpatient setting, MEWS can be modified to suit the situations in outpatient clinics [12]. Although nurses in outpatient settings are Basic life support (BLS) certified, practicing case scenarios, using the resources available to them, such as standardized assessment tools, annual case scenario or low fidelity competency training, and application of their BLS knowledge will enhance their knowledge, competence, and self-confidence and improve patient outcomes.

Acknowledgment

Special thanks to Dr. Nicholas Webb and Dr. Elena Capella at the University of San Francisco, California, for their support.

Special thanks to my husband, Goddy Ikeme, and my children, Jesse, Chima, and Casey Ikeme for their love and support.

University of San Francisco California and Santa Clara Valley Medical Center Hospitals and Clinics.

Conflict of Interest

There was no conflict of interest or funding support for the publication of this manuscript.

References

[1] Institute of Medicine (IOM), (2001). IOM (US) Committee on Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington (DC): National Academies Press (US); 2001. Executive Summary. Available from: https://www.ncbi.nlm.nih.gov/books/NBK222271/

[2] Kohn, L. T., Corrigan, J. M., & Donaldson, M. S. (Eds.). (2000). *To Err is Human: Building a Safer Health System*. Institute of Medicine (US) Committee on Quality of Health Care in America. National Academies Press (US).

[3] Bohrer, J. K. L., Vasconcelos, A. C. L., Bezerra, A. L. Q., Teixeira, C. C., Andrade, J., Santos, P. H. F. dos, & Paranaguá, T. T. de B. (2021). Patient safety culture in primary health care. *Rev Rene*, *22*, e70874. https://doi.org/10.15253/2175-6783.20212270874

[4] Sherwood, G. (2021). Quality and Safety Education for Nurses: Making progress in patient safety, learning from COVID-19. *International Journal of Nursing Sciences*, *8*(3), 249–251. https://doi.org/10.1016/j.ijnss.2021.05.009

[5] Lee, C., Mowry, J. L., Maycock, S. E., Colaianne-Wolfer, M. E., Knight, S. W., & Wyse, D. M. (2019). The impact of hospital-based in situ simulation on nurses' recognition and intervention of patient deterioration. *Journal for Nurses in Professional Development*, *35*(1), 18–24. https://doi.org/10.1097/NND.0000000000000507

[6] Smith, M. E. B., Chiovaro, J. C., O'Neil, M., Kansagara, D., Quiñones, A. R., Freeman, M., Motu'apuaka, M. L., & Slatore, C. G. (2014). Early warning system scores for clinical

deterioration in hospitalized patients: A systematic review. *Annals of the American Thoracic Society*, *11*(9), 1454–1465. https://doi.org/10.1513/AnnalsATS.201403-102OC

[7] Gerry, S., Birks, J., Bonnici, T., Watkinson, P. J., Kirtley, S., & Collins, G. S. (2017). Early warning scores for detecting deterioration in adult hospital patients: A systematic review protocol. *BMJ Open*, *7*(12), e019268. https://doi.org/10.1136/bmjopen-2017-019268

[8] Wood, C., Chaboyer, W., & Carr, P. (2019). How do nurses use early warning scoring systems to detect and act on patient deterioration to ensure patient safety? A scoping review. *International Journal of Nursing Studies*, *94*, 166–178. https://doi.org/10.1016/j.ijnurstu.2019.03.012

[9] Campbell, A. R., Kennerly, S., Swanson, M., Forbes, T., Anderson, T., & Scott, E. S. (2021). Relational quality between the rn and nursing assistant: Essential for teamwork and communication. *JONA: The Journal of Nursing Administration, Publish Ahead of Print*. https://doi.org/10.1097/NNA.0000000000001046

[10] Norris, H., New, K., & Hinsberg, F. (2019). Patient deterioration simulation education and new graduate nurses' self-confidence and competence: A pilot study. *Journal for Nurses in Professional Development*, *35*(6), 330–336. https://doi.org/10.1097/NND.0000000000000588

[11] Massey, D., Chaboyer, W., & Anderson, V. (2017). What factors influence ward nurses' recognition of and response to patient deterioration? An integrative review of the literature. *Nursing Open*, *4*(1), 6–23. https://doi.org/10.1002/nop2.53.

[12] Urban, R. W., Mumba, M., Martin, S. D., Glowicz, J., & Cipher, D. J. (2015). Modified early warning system as a predictor for hospital admissions and previous visits in

emergency departments. *Advanced Emergency Nursing Journal*, *37*(4), 281–289. https://doi.org/10.1097/TME.0000000000000076

[13] Tanner, C. A. (2006). Thinking like a nurse: A research-based model of clinical judgment in nursing. *Journal of Nursing Education*, *45*(6), 204–211. https://doi.org/10.3928/01484834-20060601-04

[14] Hanley, D., Abele, D., Alley, A. J., Smith, K., Gaden, N. W., & Phoenix Bittner, N. (2016). Creating a culture of safety through integration of an early warning system. *JONA: The Journal of Nursing Administration*, *46*(2), 63–68. https://doi.org/10.1097/NNA.0000000000000296

[15] Jang, A., & Park, H. (2021). Clinical judgment model-based nursing simulation scenario for patients with upper gastrointestinal bleeding: A mixed methods study. *PLOS ONE*, *16*(5), e0251029. https://doi.org/10.1371/journal.pone.0251029

[16] Alam, N., Hobbelink, E. L., van Tienhoven, A. J., van de Ven, P. M., Jansma, E. P., & Nanayakkara, P. W. B. (2014). The impact of the use of the Early Warning Score (EWS) on patient outcomes: A systematic review. *Resuscitation*, *85*(5), 587–594. https://doi.org/10.1016/j.resuscitation.2014.01.013

[17] Burger, D., Jordan, S., & Kyriacos, U. (2017). Validation of a modified early warning score-linked Situation-Background-Assessment-Recommendation communication tool: A mixed methods study. *Journal of Clinical Nursing*, *26*(17–18), 2794–2806. https://doi.org/10.1111/jocn.13852

[18] Dalton, M., Harrison, J., Malin, A., & Leavey, C. (2018). Factors that influence nurses' assessment of patient acuity and response to acute deterioration. *British Journal of Nursing*, *27*(4), 212–218. https://doi.org/10.12968/bjon.2018.27.4.212

[19] Melin-Johansson, C., Palmqvist, R., & Rönnberg, L. (2017). Clinical intuition in the nursing process and decision-making-A mixed-studies review. *Journal of Clinical Nursing*, *26*(23–24), 3936–3949. https://doi.org/10.1111/jocn.13814

[20] Scaramuzzo, L. A., Wong, Y., Voitle, K. L., & Gordils-Perez, J. (2014). Cardiopulmonary arrest in the outpatient setting: Enhancing patient safety through rapid response algorithms and simulation teaching. *Clinical Journal of Oncology Nursing*, *18*(1), 61–64. https://doi.org/10.1188/14.CJON.61-64

[21] Elder, L. (2017). Simulation: A tool to assist nursing professional development practitioners to help nurses to better recognize early signs of clinical deterioration of patients. *Journal for Nurses in Professional Development*, *33*(3), 127–130. https://doi.org/10.1097/NND.0000000000000342

[22] Ludikhuize, J., Borgert, M., Binnekade, J., Subbe, C., Dongelmans, D., & Goossens, A., (2014). Standardized measurement of the modified early warning score results in enhanced implementation of a rapid response system: A quasi-experimental study. *Resuscitation*, *85*(5), 676–682. https://doi.org/10.1016/j.resuscitation.2014.02.009

[23] Joho, A. A., Kibusi, S. M., & Mwampagatwa, I. (2021). The Impact of Low Fidelity Simulation on Nurse Competence in Active Management of Third Stage of Labor: An Intervention Study in Primary HealthCare Settings in Tanzania. *Clinical Simulation in Nursing*, *56*, 10–21. https://doi.org/https://doi.org/10.1016/j.ecns.2021.03.009

[24] Parker, C. G. (2014). Decision-Making Models used by Medical-Surgical Nurses to Activate Rapid Response Teams. *MEDSURG Nursing*, *23*(3), 159–164.

[25] Jenkins, S. H., Astroth, K. S., & Woith, W. M. (2015). Non-critical-care nurses' perceptions of facilitators and barriers to rapid response team activation: *Journal for Nurses in*

Professional Development, *31*(5), 264–270. https://doi.org/10.1097/NND.0000000000000168

[26] Williams, T. A., Tohira, H., Finn, J., Perkins, G. D., & Ho, K. M. (2016). The ability of early warning scores (Ews) to detect critical illness in the prehospital setting: A systematic review. *Resuscitation*, *102*, 35–43. https://doi.org/10.1016/j.resuscitation.2016.02.011

[27] Maciver, M. (2021). Pre-hospital use of early warning scores to improve detection and outcomes of sepsis. *British Journal of Community Nursing*, *26*(3), 122–129. https://doi.org/10.12968/bjcn.2021.26.3.122

[28] Langkjaer, C. S., Bove, D. G., Nielsen, P. B., Iversen, K. K., Bestle, M. H., & Bunkenborg, G. (2021). Nurses' experiences and perceptions of two early warning score systems to identify patient deterioration—A focus group study. *Nursing Open*, *8*(4), 1788–1796. https://doi.org/10.1002/nop2.821

[29] Granitto, M., Linenfelser, P., Hursey, R., Parsons, M., & Norton, C. (2020). Empowering nurses to activate the rapid response team. *Nursing*, *50*(6), 52–57. https://doi.org/10.1097/01.NURSE.0000662356.08413.90

[30] American Nurses Association, (2015). Nursing Scope and Standards of Practice, Third Edition. http://www.Nursesbooks.org

[31] Finkelman, A. W. (2018). *Quality improvement: A guide for integration in nursing*. Jones & Bartlett Learning.