Evaluating how Rapid Response Training affects the usage of Early Warning Scores and results for patients in acute care units

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Abstract

The Early Warning Score (EWS) helps doctors detect patients who are getting worse, so they can step in early for better outcomes. The impact of the Rapid Response Training (RRT) program on nurse use of EWS and results for patients was studied in this research. The nurses involved in this intervention were from two tertiary hospitals and the process lasted for two weeks, with part of it being spent on practice in stressful situations and observing actual clinical cases. Data on patients taken before and after the training were examined to check how fast the students responded, how correctly they escalated and what the end results were. Research findings showed that the people in the intervention group experienced greater efficiency in their response and fewer accidental ICU transfers (p < 0.01). It highlights that focusing on training for frontline nurses is useful for making rapid response systems more efficient and keeping patients safer in high-risk hospital areas.

Keywords: *Rapid Response Training, Early Warning Score, acute care, patient safety, ICU transfers, nursing education, clinical outcomes.*

Introduction

Why it is Important to Notice Early Clinical Deterioration in Acute Care Units

Spotting deterioration in a patient in acute care units quickly can help stop bad events like heart arrest, breathing problems and unplanned admission to the ICU. If we can identify a patient is declining early, healthcare professionals can respond rapidly and give better care which can decrease the risks of worsening the patient's condition. While there have been many improvements in medical care and observing patients' health, not noticing an early decline in condition is still a frequent issue in hospitals which can delay corrective actions. It is therefore important to spot and treat quickly any changes in patients' conditions to safeguard patient safety and raise standards of care when patients are critically ill.

Clinicians can use Early Warning Scores (EWS) to monitor changes in a patient's bodily functions. Such systems assign points to patients based on heart rate, respiratory rate, blood pressure and oxygen saturation levels in order to detect patients who may get worse medically. Nursing teams are notified quickly when a patient's assessment shows results above the threshold.

The Purpose and Importance of Early Warning Scores (EWS)

Detecting when patients are getting worse is made easier by using Early Warning Scores (EWS) in healthcare. They make it possible for health professionals, specifically nurses, to notice possible health changes right away and act on them. EWS is designed to standardize the process of identifying patients who may deteriorate, reduce deaths, stop emergency ICU stays and promote better patient outcomes.(1)

EWS systems in acute care help create defined rules for escalation which depends less on personal opinions among staff. EWS often sets off the activation of Rapid Response Teams (RRTs) in many hospitals which involve various healthcare professionals to treat sudden patient crises. Studies point out that because of EWS, patients get timely care and intervention for serious complications.

Still, for EWS to be useful, the people handling it should be experienced nurses who are present day and night at patients' bedsides. It is usually nurses who notice the beginning of a crisis, so it is important for them to apply EWS correctly and rapidly.(2)

Problems Experienced by Nurses in Correctly and Regularly Identifying EWS

Although Early Warning Scores are useful, various problems make it hard to use them well in hospitals. It is a big concern that nurses do not apply EWS in a consistent manner. While nurses are taught to use EWS, their skills in noticing and associating changes in vital signs vary a lot. Variability in healthcare professionals is caused by feelings of uncertainty, lack of full knowledge and the short time frames found in emergency care. Handling so

much information may overwhelm nurses or they might struggle with being confident in handling EWS alerts effectively.

In addition, things like a person's fatigue, heavy workload or stress can affect the reliability of EWS. In a hospital where things are happening quickly, nurses may not be able to focus on giving EWS scores every time. When use of EWS is not the same, it might lead to delayed or missed interventions which could affect patients in a negative way.(3)

Gaining knowledge and skills helps people solve these issues. Even though there are structured training programs, nurses Still require more practical and engaging ways to improve their use of EWS. Rapid Response Training (RRT), for example, improves not just the technical skills of nurses but also their confidence and ability to make decisions when things happen.

The goal of the study is to see what effect Quick Response Training (RRT) has on using the EWS and patient outcomes.

The main goal is to measure whether a well-defined Rapid Response Training (RRT) helps nursing staff use Early Warning Scores (EWS) and improves patient outcomes in acute care areas.Offering nurses situations to work through, direct observation and advice on using EWS is meant to increase their reaction time, their ability to choose the correct escalation and to support the overall safety of patients.

This study is designed to specifically:

1. Study if there is an improvement in nurses' accuracy and interpretation of Early Warning Scores because of RRT intervention.
2. Assess whether there are better patient outcomes, especially in how quickly, when and how the situation is escalated and the reduction of inadvertent ICU transfers.
3. Study whether training affects how confident nurses are and how effectively they identify early signs of clinical deterioration.

The main goal of this review is to show whether RRT programs can improve how EWS are used and help strengthen rapid response systems in hospitals. Showing that challenges with EWS can be resolved through well-planned training programs, the study intends to prove that this increases safety and quality for hospitalized patients.

Literature Review

Explanation of EWS and its Usage

Healthcare practitioners use Early Warning Scores (EWS) to understand a patient's condition and spot early changes that may signal deterioration. When these vital signs are looked at such as heart rate, respiratory rate, blood pressure, temperature and oxygen saturation, EWS systems provide a score that helps healthcare staff point out patients who may experience cardiac arrest, sepsis or failure of the respiratory system. EWS gives an early warning, prompting health professionals to take action before the patient's health gets much worse.(4)

EWS systems are considered useful in clinics, as they use standard guidelines to spot whether a patient is getting worse in any healthcare setting. A study suggests using Early Warning Systems helps doctors detect patient changes quicker, saves lives and results in fewer emergency ICU admissions (Smith et al., 2015). Its usefulness is clear when EWS is a part of Rapid Response Systems (RRS), since it immediately causes a Rapid Response Team (RRT) to be activated, made up of clinicians who respond quickly to help the patient. It is intended to stop further decline, achieve better results in care and improve how resources are used in intensive care and similar units.

Even though EWS benefits are noticeable, it can still be hard to use. Reasons for different scoring or actions by one person may exist which could result in opportunities being missed for essential, fast intervention. This stresses that continuous education is necessary so that nurses and other healthcare staff can pick up on any clinical changes and quickly apply EWS.(5)

Present deficiencies in Rapid Response Systems Training

No matter EWS being considered a key instrument in early detection, there are still uncovered areas in nurse training and applying such systems regularly in different practices. According to Jones et al. (2017), many hospitals have put EWS into practice, yet due to insufficient training on using the system, its use is not always as effective as it should be. Because they are the ones who usually evaluate a patient when they arrive, nurses play a key role in using EWS correctly. According to research, many nurses face problems with having faith and reliability when making use of EWS (Martin et al., 2018). Several things cause this, like less time learning what to do during an emergency, few practical sessions and limited updates during their shifts.

There is also a big gap because there aren't many targeted training opportunities for applying EWS in an emergency. Although EWS education is part of nursing programs, the information is usually only taught in theory, so nurses may not apply it to real, demanding situations. Also, there is often not enough opportunity for nurses to engage in practice exercises for handling various emergency situations in a safe setting. Little time spent learning important skills leads to delays in treating patients which may result in negative outcomes for patients.

Best Practice and Standards Around the World for Carrying out EWS(6)

In several countries, healthcare systems now believe that using Early Warning Scores is key to making their patient safety programs better. A number of countries have made EWS a part of their systems for improving patient safety and quality. In the United Kingdom, the National Institute for Health and Care Excellence (NICE) includes recommendations for using EWS in acute and critical care areas, highlighting the need to act quickly when patients start to deteriorate (NICE, 2017).

Australia has introduced EWS in most of its public and private hospitals and they have seen improvement in spotting the early warning signs of patient deterioration. The Australian Commission on Safety and Quality in Health Care created guidelines calling on healthcare providers to respond to EWS triggers through structured teams such as the Rapid Response Teams (RRTs) (ACSQHC, 2019). They point out that regular education for nurses and other healthcare team members improves how EWS is used.

Hospitals in North America use EWS differently and scientific research has demonstrated that those using EWS linked to their EHR can more quickly and correctly detect patients who may face risks (Green et al., 2016). Combining EWS and real-time clinical alerts has demonstrated it can speed up response and lessen occurrences of cardiac arrest and sepsis.(7)

Progress has been made, but many parts of the world, particularly LMICs, still have trouble applying these new ideas because of limited resources and training. Customizing international guidelines to match the local situation, making sure staff are properly trained and considering culture is necessary for proper EWS implementation.

Past Studies Looking at Relationships Between Nurse Education and Patient Results

A number of studies have looked into how training for nurses influences how Early Warning Scores influence patients' outcomes. A great deal of information has proven that high-quality education for nurses leads to a lower risk of patient harm and enhances health outcomes. Kane et al. (2015) found that better training in EWS among nurses helped cut down the chances of unexpected ICU admissions and cardiac arrest greatly. Also, if physicians were involved in simulated real-life training, they improved most in clinical decision-making and accuracy when escalating patients.

Research in the United States noted that patients received better outcomes after nurses partook in Rapid Response Training (RRT) which helped them identify clinical deterioration sooner and allowed for better care (Smith et al., 2019). The training made the nursing team feel more confident and capable which helped them assist patients quicker and increase the quality of care.

A research project in Canada carried out by Jones et al. (2017) discovered that combining simulation with immediate feedback in RRT helped patients by making a difference such as a decline in events like cardiac arrest and issues caused by sepsis. As a result of the program, program participants felt more certain about using EWS and they had a 20% higher success rate in escalating care compared to the group that did not participate.

There is strong proof that targeted EWS programs for nurses help them better which improves patient outcomes and lowers both chances of ICU readmission and death.(8)

Methodology

Design of the Study: Quantitative Interventional Study (Pre-Post Analysis)

The research used a quantitative interventional design and used pre-post analysis to find out if Rapid Response Training (RRT) helped nurses reach proficiency with Early Warning Scores (EWS) and what effect this had on patient outcomes. Thanks to the design, it was possible to find out if the process took less time, whether the calls were handled more accurately and whether patients improved after the changes. It was decided to evaluate how well nurses performed and how patients fared after receiving the training, using the pre-post analysis design.

The research was done in the Acute Care Units of two McMaster Tertiary Hospitals.

The research was carried out in acute care units at two tertiary hospitals, where Rapid Response Systems (RRS) and Early Warning Scores (EWS) were already used. They were picked because they could take part in the study and already have suitable structures for handling medical emergencies and offering training. Since acute care

included many specialties, there were many kinds of patients which allowed nurses to handle a range of clinical situations while on duty.

Participants in the study are 72 Registered Nurses

There were 72 registered nurses who took part in the study at the two hospitals. Exactly who was included in the study depended on these criteria:

1. Registered nurses working on the critical care units in the selected hospitals.
2. Nurses with little EWS training and experience gained from previous clinical work, but they had not received formal training in EWS during the past year.
3. Taking part in the Rapid Response Training (RRT) program and giving feedback about the course.

Data Collection:

Both a pre-intervention and a post-intervention measure of nurses' performance was chosen to assess the impact of the training. In the beginning, we recorded nurses' rated accuracy and confidence with EWS and after training we looked at any changes in these aspects. Metrics aiming to judge EWS accuracy, the quick timing of escalations and the correct response to deteriorating health.

The study used many patient outcome metrics to see whether the intervention affected clinical outcomes.

The number of minutes elapsed from the point where it becomes clear a patient is deteriorating (through EWS scores) to when the Rapid Response Team (RRT) is called.

The circumstances where a patient's situation was handled by a higher team, for example by sending them to the ICU or calling the Rapid Response Team (RRT).(9)

ICU transfers: The count of patients who needed unanticipated ICU care to measure how promptly the nursing staff handled those whose conditions quickly worsened.

Tools Used:

- An audit using a tool was carried out to make sure all nurses performed EWS scoring properly according to the protocol.
- Nurses documented the timings during which they noticed a patient was deteriorating and raised the alarm to supervisors. Evaluation of the logs let us see if the response times had improved after the training.
- A survey was given to staff at the end of the training to assess their feelings about the course, whether it was effective, relevant and the examples were easy to understand. Views were also collected about nurses' confidence and how comfortable they were with early warning signs and increasing treatment.

Ethical Considerations:

All participants gave written consent informing them about the study before it began. The process of getting their consent explained to nurses what the study was for, how it would be done and any dangers that might occur. Everyone was told that they were free to join or leave the study at their own will and there would be no side effects. Ethical Approval: The research was given ethical approval by the institutional review board (IRB) at both hospitals involved. IRB review made certain that everything in the study was conducted according to ethical rules for human research and it required data and participant privacy.

Every piece of data gathered in the study was kept confidential. Patient details were removed from the records and personal details of nurses were not included in the data. All the data were secure and just those working on the project could view the records.

Data Analysis:

They applied paired t-tests or Wilcoxon signed-rank tests (based on the nature of the data) to measure differences in performance before and after the training program. It measured the extent to which training supported better performance by nurses in terms of early warning score accuracy, time to react and accuracy in alerting others.

A thematic analysis of the feedback gathered from nurses was used to find main themes about their participation in the training program. Doing this qualitative analysis assisted in learning how nurses' confidence, expertise and outlook on EWS changed due to the intervention.(10)

Results

Effective nursing care requires that nurses keep up-to-date with their abilities.

1. **Difference in the accuracy of EWS Calculation (Pre vs Post)**

   The major outcome to measure nurse proficiency was how well EWS were computed. Nurses' skills in using and understanding Early Warning Scores were checked before and following the Rapid Response

Training (RRT). It was found that nurses had an average accuracy rate of 72.5% (with a standard deviation of 8.2) in calculating EWS scores before receiving training. Post therapy, the mean correctness of responses increased to 88.4% (SD = 5.7) which is 15.9% better than pre-therapy (p < 0.01). This means the RRT program helped nurses learn and use EWS well which led to better scoring of patients.

2. **Escalation Appropriateness**

Escalation appropriateness was studied by examining how many times the right decision to activate a Rapid Response Team (RRT) or increase care was made according to EWS scores. Nurses achieved a correct escalation rate of around 65% (with the standard error of 10.4%), before going through simulated training. The deluge was handled better after training, as the correct escalation rate increased to 82.3% (SD = 7.9%), a rise of 17.3% (p < 0.05). As a result of the training, nurses now make better calls about escalation situations, ensuring quick help to patients in trouble.

Measuring the Outcomes for Patients

3. **More patients are getting proper care in the ward, so there is less need for unplanned ICU transfers.**

Decreasing unplanned ICU transfers was an important patient outcome metric. Before the intervention was carried out, the hospital reported 8.5 unplanned ICU transfers out of each 100 patients admitted. After the intervention, the amount of unplanned ICU transfers per 100 admissions went down to 5.1 (p < 0.01), a decrease of 40%. Thanks to the training, nurses were now able to pick up signs of diminishing health much sooner and handle patients well, often avoiding a move to intensive care.

4. **Better and quicker medical support.**

How quickly the Rapid Response Team (RRT) or escalated care was given after a deteriorating patient was identified was considered another important outcome. The average waiting time before the intervention was 18.4 minutes (with a standard deviation of 5.2). Once the intervention was done, the time it took to respond dropped to 12.6 minutes (SD = 4.1), showing a 32% reduction from previous levels (p < 0.01). A faster response time shows the effectiveness of training at making healthcare teams act fast in urgent situations.

Statistical Analysis

The data was examined using paired t-tests and ANOVA to find out if the intervention affected the proficiency of nurses and outcomes for patients.

Pre- and post-training results of nurses in assessing EWS and when to escalate the care were compared using paired t-tests. Both measures showed positive results and the p-values were less than 0.05, indicating that training made a real difference in how nurses performed.

ANOVA helped to see if there were differences in patient outcomes (transfer to ICU and response times) when comparing different hospital units and the group treated by the intervention. There were clear improvements in both metrics that were significantly strong, proven by a p-value of less than 0.05.

Significance Level

For all statistical tests, p was set less than 0.05 to make sure observed variations were valid and not just by chance. Based on the analysis, using the Rapid Response Training (RRT) helped nurses become more skilled at using EWS and improved patient outcomes in terms of faster reaction times and getting transferred to the ICU.

Effects for Nursing Practice

Guiding Principles for Teaching RRT as a Regular Part of Nurse Education

Following these findings, this study suggests that all acute care nurses should include Rapid Response Training (RRT) in their regular training plans. The study showed that using mock scenarios and immediate supervision in RRT training strengthens nurses' skills in using Early Warning Scores (EWS) which in turn improves patient outcomes by reducing shock admissions and their response time.

RRT should be taught in nursing schools as well as during ongoing professional training. Starting early, doctors should show new nurses the RRT system, so they practice using the EWS during their early days in clinical work. Giving frequent sessions on Emergency Warning Signals and rapid response protocols to experienced nurses ensures they are ready and sure about carrying out both activities.

Familiarity with simulation-based training in nurse education allows students to improve their ability to escalate care, respond to critical changes and quickly activate the Rapid Response Team (RRT) in a safe way. Using this

approach improves a nurse's ability to remember skills and to think critically and make good choices when working with patients.

Ongoing observation and examination of how EWS are used is important.

Because training affects how EWS are used and patient results, healthcare institutions must regularly review and evaluate how their EWS are applied and whether training programs are still effective. Checking if nurses are following EWS guidelines properly and the same way requires regular reviews of its application. The review of patient files allows checking how often EWS alerts prompt action and how often those actions improve patient outcomes such as avoiding trials in ICU or experiencing less serious complications.

The nursing staff should be informed in real time about their EWS use to improve their performance immediately. Members of the clinical team or nurses with teaching responsibilities may look at cases where patients deteriorated and find ways the EWS system could be improved. They ought to create a framework that encourages people to see mistakes as ways to grow better, rather than being seen as something bad.

Also, they must put in place systems to track how quickly the team reacts and how accurately it handles escalations, making use of this information in a wider effort to improve quality. Regularly checking how EWS is applied helps institutions make sure the tool continues to work reliably for diagnosing early signs of patient deterioration.

There should be involvement from both the institution and clinical leaders.

Rapid Response Training (RRT) and the use of Early Warning Scores (EWS) will have a lasting effect on nursing only if management and senior nursing staff are fully involved. for RRT programs to work successfully in nursing, institutions must be ready to support them throughout the curriculum, provide the needed resources and encourage involvement from top leaders. Especially, this help should enable training programs, funds for useful material and easy access to advanced tools for nurses.

Leaders in the clinic are important for supporting and persuading acute care units to use EWS. Nurse managers, clinical educators and senior nursing staff should ensure that early warning systems are recognised and used equally in every shift and department. Those leading clinics ought to guide new training, check how the protocol is being used and address difficulties nurses meet. Because they are involved, the training program reflects the goals of the organization and protects patient safety.

Additionally, when leaders agree, a safety culture is formed in the hospital where the hospital's rapid response team is properly supported and managed. Hospital administrators should acknowledge that such programs contribute to safety and give proper resources, effort and attention to help the programs succeed.

Conclusion

This research confirms that using Rapid Response Training (RRT) enhances nurses' ability to use Early Warning Scores (EWS), prompting faster clinical steps and lessening patient risk in acute care units. RRT empowered nurses by improving their patient observation skills, their judgment in deciding when to escalate care and their EWS calculation proficiency. Better patient results such as less need for sudden ICU transfer and quicker emergency action, were a direct result of these upgrades.

What the research suggests is that strict and focused training is essential to improve the safety and wellbeing of patients in acute care units. Having nurses prepared with knowledge, skills and confidence in EWS helps hospitals spot early signs of clinical deterioration and respond promptly which leads to better patient results and fewer threatening complications.

The results suggest that specially designed educational programs such as RRT, may greatly improve safety culture in the healthcare sector. Making sure that everyone is rehearsing with early warning systems and having support from the hospital, will improve how effectively rapid responses can be carried out, benefiting all patients and lifting the overall clinical performance. Hospitals should look at making Rapid Response Training a standard part of nursing education, so EWS can be used more effectively and patient safety in acute areas is improved.

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