

MEDICAL-SURGICAL NURSES' EXPERIENCES OF CALLING A RAPID RESPONSE TEAM IN A HOSPITAL SETTING: A LITERATURE REVIEW

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Abstract

Background: The rapid response team (RRT) decreases rates of mortality and morbidity in hospital and decreases the number of patient readmissions to the intensive care unit. This team helps patients before they have any signs of deterioration related to cardiac or pulmonary arrest. The aim of the RRT is to accelerate recognition and treatment of a critically ill patient. In addition, in order to be ready to spring into action without delay, the RRT must be on site and accessible, with good skills and training for emergency cases. It has been reported that many hospitals are familiar with the concept of RRTs. There is a difference between this team and a cardiac arrest team, since the RRT intervenes before a patient experiences cardiac or respiratory arrest.

Aim: To describe current knowledge about medical-surgical nurses' experiences when they call an RRT to save patients' lives.

Method: The method used by the author was a literature review. The PubMed search database was used and 15 articles were selected, all of which were primary academic studies. Articles were analysed and classified according to specified guidelines; only articles of grades I and II were included.

Results: Years of experience and qualifications characterise the ability of a medical-surgical nurse to decide whether or not to call the RRT. Knowledge and skills are also important; some hospitals provide education about RRTs, while others do not. Teamwork between bedside nurses and RRTs is effective in ensuring quality care. There are some challenges that might affect the outcome of patient care: The method of communication is particularly important in highlighting what nurses need RRTs to do in order to have fast intervention.

Conclusion: Medical-surgical nurses call RRTs to help save patients' lives, and depend on their experience when they call RRTs. Both medical-surgical nurses and RRTs need to collaborate during the delivery of care to the patient. Good knowledge and communication skills are important in delivering fast intervention to a critically ill patient, so that deteriorating clinical signs requiring intervention can be identified.

Key words: Medical-surgical nurse, rapid response team, experiences, challenges, hospital.

Introduction

There are some hospitals that apply plans to prevent mortality and morbidity for patients who are critically ill, by using guidelines to protect patients when a staff nurse notices signs of instability before undergoing cardiac arrest (Chan, Jain, Nallmothu, Berg, & Sasson, 2010; Butner, 2011). A nurse who is assigned to a critically ill patient will have the chance to help the patient to survive. Not all nurses expect that their patient is experiencing an arrest (Dwyer & Mosel, 2002). However, many studies have reported that the hospital staff's failure to recognise the early signs of deterioration in patients, such as decreasing systolic pressure and abnormal breathing, can lead to serious concerns, such as some cases like post surgical infection, cardiac arrest code and even death (Abella et al, 2005; Peberdy et al., 2003).

A patient has the right to receive good quality of care (Burkhardt & Nathaniel, 2008). Good quality of care means improving the available health services for individuals to achieve their desired outcomes (Vincent, 2010). Furthermore, good quality of care, from a hospital administration's point of view, means the prevention of illness, infection, and decreases the Intensive Care Unit (ICU) re-admissions. It has been suggested that, in order to improve patient outcomes, surveillance to identify problems should be linked to effective responses (Green & Allison, 2006). To tackle this issue, a system termed 'the Rapid Response Team' has been initiated (Institute for Health Improvement [IHI], 2013). The Rapid Response Team helps to decrease mortality and morbidity rates, and also allows nurses to intervene when a patient has signs of deterioration before they experience a cardiopulmonary arrest (Jenkins & Lindsey, 2010).

Background

Around 60 per cent of hospitals in the US have experiences with patients who undergo cardiopulmonary arrest (Winter et al., 2007). Other studies show that most of the clinical deterioration signs for patients are exhibited before they reach cardiopulmonary arrest (Azzopardi, Kinney, Moulden & Tibballs, 2011). Health care professionals have a responsibility to know the signs of deterioration for critically ill patients and to have responses to prevent it. Not all professional health care workers recognise the signs that lead to death (National Patient Safety Agency, 2007; National Confidential Enquiry into Patient Outcome And Death, 2005). There are some challenges that hospitals face, such as managing healthcare workers and providing available resources, in achieving and managing patient care and outcomes of patient services (Rogers et al, 2004).

The Institute of Healthcare Improvement ([IHI], 2013) established in 1980 by Dr Don Berwick, works with a group of committed individuals to re-design healthcare into a system without delay, time consuming tasks, errors and unsustainable costs. The IHI focuses on key aspects, including person- and family-centred care, improvement

capability, patient safety, and quality, cost and value. The goal of the IHI is to improve the lives of the patients and health communication. They concentrate on safety, effectiveness, time lines, efficiency, and equity.

Rapid Response Team: Strategies for Saving Lives

The Institute of Health Care Improvement (2001) undertook the initiative of the 100,000 Lives Campaign in 2004, intended to reduce mortality and morbidity rates. This initiative's strategies is to implement the best practice and also to prevent pressure ulcers, reduce methicillin-resistant *Staphylococcus aureus* (MRSA) infection through control processes and policy, reduce infection through basic changes in infection control processes, reduce surgical complications by implementing changes in care, and prevent harm caused by high-alert medications, beginning with a focus on anticoagulants, sedatives, narcotics and insulin. They achieved this goal, partly by recommending the implementation of a Rapid Response Team (RRT).

The goal of this campaign was to save 100,000 lives during the time from its launch in December 2004 until June 2006. Since then they have launched a successor, the Save 5 Million Lives Campaign. In December 2006, the Institute of Healthcare Improvement recommended implementing the RRT as one of six strategies used to identify patients who were experiencing pre-arrest in unplanned ICU admission. The strategies behind the implementation of the RRT were to bring ICU-level patient care to the bedside of critically ill patients, to work together, and to assess and intervene in order to save patients' lives (Institute of Healthcare Improvement, 2013).

Currently, more than 25 per cent of US hospitals use RRTs to decrease the incidence of cardiopulmonary arrest, re-admissions to the ICU and deaths by providing early intervention for patients whose conditions are acute and progressively deteriorating (Donaldson, Shapiro, & Scott, 2009).

Different Terms for the Rapid Response Team

It is important to understand the terminology of the Rapid Response Teams. In the past, they were called Medical Emergency Teams (METs) or Medical Emergency Response Teams (MERT), and other terms including Patient at Risk Team (PART) and Critical Care Outreach Team (CCOT) have also been used. Some of these terms are interchangeable in places such as Australia, where RRT and MET have the same meaning (DeVita, Hillman, & Bellomo, 2011).

The similarity between the RRT and the MET is that they help critically ill patients from the emergence of any signs that could lead to cardiac or respiratory arrest. Both maintain the two key features of an afferent limb, such as how the team is activated, and an efferent limb, such as the response of the team. There are, however,

some differences between them: RRT is generally used to mean a nurse-led team, and the MET is generally a physician-led team. In this thesis, the author will use the term 'Rapid Response Team' to cover all of these terms, as it is the most commonly used variant in the literature (DeVita, Bellomo, Hillman, et al, 2006).

Definition of the Rapid Response Team and its Purpose

DeVita et al. (2011) defined a Rapid Response Team (RRT) as a group of healthcare professionals who are trained for critical cases and deliver quick critical care. A RRT's members come from multiple disciplines, including an intensivist, a physician's assistant, a critical care nurse and a respiratory therapist.

The purpose of this team is to be ready to spring into action without delay, and they must be onsite and accessible; they must have good skills and be trained well for emergency cases (Moldenhare, Sabel, Chu, & Mehler, 2009).

An RRT is able to respond rapidly to a deteriorating patient with an average response time of less than five minutes (range: 2-10 minutes), and the duration of RRT calls averages between 20 and 35 minutes (range: 5-98 minutes). A RRT is intended to prevent hospital deaths caused by medical error in medical-surgical wards or wherever they occur, such as in an intensive care unit (Hatler et al., 2009; Chamberlain & Donley, 2008).

Hospital Mortality and Morbidity

Numerous studies have shown the numbers of patient lives saved when RRTs have been activated. A study in one hospital indicated that the RRT was called 344 times over a period of 18 months. The same study reported 7.6 cardiac arrests per 1,000 discharges each month over a five-month period before the RRT was implemented. However, with the introduction of the RRT, the number of cardiac arrests over a 13-month period subsequently decreased to three episodes of cardiac arrest per 1,000 discharges each month. Prior to the implementation of the RRT, the mortality rate was 2.82 per cent; after the RRT implementation, it decreased to 2.35 per cent. Additionally, the percentage of ICU re-admissions decreased from 45 per cent to 29 per cent (Dacey et al., 2007).

According to Bellomo et al. (2004), the implementation of RRTs reduced adverse events in postoperative patients, such as severe sepsis, respiratory failure, stroke, and acute renal failure. It also reduced the duration of hospital stays. There were 1,369 operations for 1,116 patients during the control period and 1,313 for 1,067 patients after the intervention of the rapid response team (RRT). The result was a decrease in the rate of respiratory failure incidents to 57 per cent, while the relative stroke risk reduction was 78 per cent; severe sepsis had a relative reduction of 74.3 per cent; acute renal failure requiring

renal replacement therapy relative reduction had a relative reduction of 88.5 per cent; and emergency intensive care admissions were reduced to 66.4 per cent. Furthermore, the rate of postoperative death dropped to 36.6 per cent, and the average duration of hospital stays decreased from 23.8 days to 19.8 days.

DeVita et al. (2006)'s findings supported the conclusion that the use of RRTs indeed decreases adverse outcomes and unplanned ICU admissions, and stated that hospitals should implement RRTs.

A recent study compared mortality rates before and after the implementation of RRTs. It was indicated that the initial mortality rate was 22.5 individuals per 1,000 hospital admissions. After the RRTs were implemented, the mortality rate dropped to 20.2 per 1,000 hospital admissions. The utilisation of RRTs decreased the mortality rate, as well as decreased ICU re-admission (Alqahtani et al., 2013).

Another hospital indicated that the number of cardiopulmonary arrests before implementing a RRT was 75 per 1,000 admissions in 2006; after implementing the RRT, the number of cardiopulmonary arrests decreased from 59 to 37 per 1,000 admissions during 2007 and 2008 (Hijazi, Sinno, & Alansar, 2012).

Another study found that, from 378 calls for a RRT during a time period spanning from 9 months before until 27 months after implementing a RRT, cardiac arrests were reduced by 57 percent, amounting to a reduction of 5.6 cardiac arrests per 1000 hospital discharges. Around 51 arrests were prevented (Geoffrey, Parast, Rapoport, & Wagner, 2010).

Konrad et al. (2009) found that, in a hospital where the number of RRT calls was 9.3 per 1,000 hospital admissions, the MET implementation was associated with a 10 per cent reduction in total hospital mortality. The number of cardiac arrests per 1,000 admissions decreased from 1.12 to 0.83; mortality was also reduced for medical patients by 12 per cent, and for surgical patients not operated upon by 28 per cent. The 30-day mortality pre-MET was 25 per cent versus 7.9 per cent following the MET implementation compared with historical controls. Similarly, the 180-day mortality was 37.5 per cent versus 15.8 per cent, respectively.

The study by Scott and Elliot (2009) showed that before implementing RRTs, 22 cardiac codes were called per month. After implementing RRTs, this number decreased to 14 per month. Before the implementation, the cardiac codes were mostly called for patients who required intubation; afterwards, the cardiac codes were seldom used for intubated patients because the RRT had been called before the patient's condition deteriorated.

The Criteria for and Purpose of Calling RRTs

When the medical-surgical nurse calls the RRT, there are certain criteria involved in the decision. When a medical-surgical nurse notices that their patient is almost at the point of requiring intervention, the staff nurse will review the criteria to assess a patient before calling the RRT. Each hospital must use certain criteria when it comes to calling RRT. The following will help to determine who should call RRT; using the proper protocol will help to reduce the incidence of mortality and morbidity due to unexpected cardiac arrests in the hospital (Buist, 2002). A study found that, through implementing RRTs, the number of calls for RRTs increased through an understanding of their outcome in saving patients' lives (Hillman, et al., 2005).

Each member of the team has a role to play during an intervention. The role of the RRT nurses is to assist the bedside nurses and to assess patients alongside them. The role of the physician is to assess the patient, evaluate the clinical findings in relation to the patient's history, and to determine the appropriate intervention with the other team members. Calling the RRT is commonly done for surgical patients, emergency department patients, elderly patients with multiple comorbidities, and critically ill patients with a longer length of stay at the hospital (Young, Donald, Parr, & Hillman, 2008). The criteria that a nurse in a medical or surgical ward should follow in deciding whether to call an RRT are shown in Table 1.

The impact of implementing a RRT is to maximise the climate of safety for a medical-surgical patient. Promoting a more cohesive clinical approach hospital-wide, such teams augment expertise and communication with the skills of the nurses throughout the facility (Sharek et al., 2007).

Process for Calling a Rapid Response Team

Each hospital uses a framework for RRTs, with plans and the mechanisms in place for a deteriorating patient. When

a nurse notices that a patient's condition is declining, after applying the criteria, the nurse will call the RRT by pager or telephone extension per the hospital's protocol (Institute for Clinical System Improvement, [ICSI], 2013). The nurse will then give a verbal report of relevant information using the communication tool of SBAR: 'Situation' refers to the room, the ward and a brief about the patient, including the name, age, admission date and the reasons for admission; 'Background' covers information about the patient's history and conditions, a list of medications, lab results and other clinical information; 'Assessment' is the nurse's assessment of the situation; and 'Recommendation' is what the nurse recommends, such as whether a patient needs to be seen immediately or needs an X-ray (Ray et al., 2009; Cretikos et al., 2006).

According to the Institute of Health Care Improvement (2013), SBAR is an easy and effective tool for communication about a patient between staff members.

Definition of Nursing and Nurses' Responsibilities

Nursing is defined as protecting, promoting and optimising health care while preventing illness and alleviating suffering through diagnosis and treatment. Nursing is primarily concerned with providing care to the physically ill, mentally ill and disabled. Nursing includes collaborative care for individuals of all ages, regardless of family, group or community, sick or well, in all settings (International Council of Nurses, 2012).

Nurses are responsible for patient care, where each nurse is accountable for his or her individual nursing practice, performing assigned tasks and providing optimum care. In all their other responsibilities, such as administration, teaching and research, each nurse is responsible for the quality of practice within their standard of care (American Nurse Association, 2011).

Table 1: The clinical criteria for calling a RRT

The clinical criteria for calling a rapid response team (RRT):
Any staff member (nurse, physical therapist, respiratory therapist, physician) is worried about the patient
Change in heart rate to <40 or >130 beats per minute (bpm)
Change in systolic blood pressure to <90 mmHg
Change in respiratory rate to <8 or >28 breaths per minute
Change in oxygen saturation to <90 % , despite O ₂
Change in the level of consciousness state
Change in urine output to <100 ml in four hours

(Institute of Health Care Improvement, 2011)

Nurses' Experience and Practice

Nurses' experience can be defined as their acquisition of knowledge and skills from feeling, seeing and doing. Another definition of nurses' experience is the achievement of a high level of knowledge, work and experience relating to healthcare from mind-body practices. Nurses' levels of understanding evolve through their experiences of practice in clinical settings (Kemper et al., 2011). In practice, nursing requires special skills and knowledge, as well as independent decision-making. Nurses must deal with different settings, types of patients, diseases and ways of giving treatment. Nurses protect those who need care (National Council of State Boards of Nursing, 2013).

Medical-Surgical Nurses

Nurses who work in medical and surgical wards are registered nurses who have been professionally registered after passing an examination to have the licence certification in order to be qualified to perform nursing care, as well as being equipped with the skills required to assess patients physically. Furthermore, they have the ability to make clinical decisions about the appropriate treatment and nursing intervention for a patient by performing an assessment, developing a plan of care and predicting patient outcomes (Keller, Edstrom, Parker, Gabriele, & Kriewald, 2012).

Problem Statement

It has been reported that many hospitals are familiar with the concept of the Rapid Response Team. The difference between the RRT and a cardiac arrest team is that the RRT intervenes before a patient experiences cardiac or respiratory arrest. The RRT is a system recommended by the Institute of Healthcare Improvement (IHI, 2010).

Significant evidence has shown that RRTs save patients' lives by mitigating medical errors, decreasing ICU admissions, and reducing the number of days spent in hospital (IHI, 2013). Because of this, the author focuses on medical-surgical nurses who are assigned to critically ill patients, who have complex responsibilities, may struggle with lacking confidence, or experience other challenges during RRT calls due to medical errors. The author also seeks responses from bedside nurses when they notice that their patient needs RRT intervention (Thomas et al., 2007).

Aim

To describe the current knowledge about medical-surgical nurses' experiences when they call Rapid Response Teams to save patients' lives.

Research Questions

- How do nurses describe their experiences of calling RRTs?

- What are the common challenges for nurses when calling RRTs?

Method

Study Design

A literature review is the gathering, analysis, and critical summary of information for a particular topic of study. The literature review is a helpful method for the researcher to collect and condense information (Polit & Beck, 2012). The fundamental aim of a literature review is to provide a comprehensive picture of the existing knowledge relating to a specific topic (Coughlan, Cronin, & Ryan, 2013). Moreover, the use of this method helps to inspire and generate new ideas by highlighting any inconsistencies in current knowledge, from among studies published in some search database such as PubMed, considered the most significant database in medicine, and including the entire field. PubMed primarily accesses the MEDLINE database, which includes references and abstracts. PubMed also involves a full articles database from different countries (Aveyard, 2010). In this study the PubMed database was used to retrieve all articles. The vocabulary and terminology used to search the PubMed database were found using MeSh (Medical subject Headings), a dictionary used for indexing articles.

Data Collection

Data collection is a formal research procedure used to help a researcher. This study performed a search to find articles relevant to nurses' experiences during calls to RRTs. PubMed is considered as the most significant database for this purpose and has been used in this study (Polit & Beck, 2012).

All 15 articles retrieved from PubMed answered the study's aim. MeSH terms were used to find some of terminology, which was then used in a free search in PubMed. However, there were no articles found in MeSh database related to this topic (Polit & Beck, 2012). The terms used in MeSh were: 'nursing' AND 'Rapid Response Team'; 'nurses' AND 'Rapid Response Team'; 'nursing' AND 'Rapid Response Team' AND 'experience' and 'nurses'; and 'challenges' AND 'Rapid Response Team' (see Table 2). The following inclusion and exclusion criteria were applied during search in selecting articles for this review.

Selection Criteria

Inclusion criteria

The inclusion criteria was to include articles, then analyse them for use in the result (Polit & Beck, 2012). This criteria used for each article included had to be written in English, with a publication date no earlier than ten years ago, and also filed under publications involving the nursing field. These were then used as the primary source texts, original studies and primary sources.

Exclusion criteria

The exclusion criteria was to exclude articles not to be used in the result, because they did not meet with criteria used in research (Polit & Beck, 2012). The criteria for each article excluded were those that were not written in English, those that were not relevant to nurses' experience in calling for RRTs, articles relating to the medical rather than nursing area, and literature reviews about RRTs. Other excluded articles were in report form and were not complete articles, while other articles were more than ten years old.

Data Analysis

Data analysis is an organisation and synthesis for a study (Polit & Beck, 2012). All 15 articles were read several times and then analysed. Each article was analysed separately and independently. The main findings were highlighted in different colours and documented on a separate piece of paper divided into two columns. The words describing nurse experiences were highlighted in green and words relating to challenges were highlighted in orange. This documentation was written up using Microsoft Word under titles and a sub title (Curtis, 2008). All of the articles were then evaluated in order to check their validity and reliability by looking at the qualifications of the authors and the study design and process (Background, Aim, Method, Results, Discussion, Ethical Considerations, and References), the number of participants in each study and the environment. Then each article was graded and classified using the guidelines for the quality of an academic article. The grade scale used was: high (I), moderate (II), or low (III) quality (see Appendix II).

Classification of Included Articles

The quality of each article and the types of methods used were classified based on the criteria of Berg, Dencker, and Skärsäter (1999) and Willman, Stoltz, and Bahtsevani (2006), and modified by Sophiahemmet University (see Appendix II). All the results relating to the article were collected and were written into the matrix table (see Appendix I). Each article used different methods ranging

between qualitative and quantitative methods. Some articles used interviews or focus groups, some used descriptive correlational design, some used qualitative ethnographic methods, and some provided quantitative numerical data examining the implementation of RRTs. Of the 15 articles used, there were 10 articles that scored grade I and the remaining articles were grade II. In addition, all articles were appraised according to the qualifications of each researcher and whether there were any ethical considerations noted, aiming to determine whether the research had received support from any company, advertisement or commercial purpose. All the articles were checked to see whether the researcher considered the environment of the study when collecting the data. Furthermore, the author checked to see if the topic was appropriate to the aim of the study. (Polit & Beck, 2012).

Ethical Considerations

Permission to do this study was obtained from Sophiahemmet University for thesis project of a bachelor degree. The author dealt with each study using equitably all articles being read and using all the results in this study, and used trustworthy data collection, analysis and interpretation to avoid any desired finding. Paraphrasing was done after the analysis of all articles. There was no adding of any personal information or comments to the articles, in the strictest effort to avoid plagiarism, falsification and fabrication while conducting data analysis. Each study was conducted in an ethical way during data collection and interpretation. References for each article have been stated in order to make it easy for the reader to locate the necessary information (Polit & Beck, 2012).

Results

The findings in this study were based on 15 articles. These articles focussed on nurses' experiences and challenges in calling RRTs. The results are presented in accordance with the research questions.

Table 2: Searches in PubMed

Search words	Number of hits	Read abstract	Read article	Chosen articles	Date
'Nurses' AND 'rapid response team'	84	56	40	5	17 SEP 2013
'Nursing' AND 'rapid response team'	130	60	60	9	01 OCT 2013
'Nursing' AND 'rapid response team' AND 'experience'	4	4	4	0	17 OCT 2013
'Nurses challenges' AND 'rapid response team'	3	3	3	1	17 OCT 2013

Nurses Describe Their Experiences of Calling RRTs

Nurses' Experiences and Qualifications

Most medical-surgical nurses were familiar with calling an RRT as part of improving patient care. Calling RRTs has increased nurses' experiences of preparedness. However, other medical-surgical nurses had been hesitant to call RRTs because the physician discouraged them to call. The decision to call an RRT depended on the years of experience of ward nurses when there was a critically ill patient requiring intervention from an RRT. Nurses who had 0-5 years of experience were less likely to call an RRT, while nurses with 11 years or more of experience called RRTs without asking other nurses (charge nurse) or the primary team. (Salamonson, Van-Heere, Everett, & Davidson, 2006)

The qualifications of nurses relate to their experiences when calling an RRT for an urgent case; those with an associate's degree in nursing (AND; who study nursing for two years) with less than or equal to three years of experience called at the request of another nurse (i.e. the nurse in charge) or a physician. Comparing this response to that of staff nurses with a bachelor of science in nursing (BSN), who have more than three years of experience and who study nursing for four years; they called the RRT following the criteria provided (Pussateri, Prior, & Kiely, 2011).

Some experienced ward nurses independently called for a RRT without waiting for any decision from the other nurses or physicians. The decision whether or not to call a RRT was based on the nurses' judgment on whether immediate assistance was needed. Some bedside nurses, who often ask for advice and consult with other nurses when unsure about whether or not to call a RRT, were encouraged to trust their own judgment before calling RRTs, in order to get the support and the affirmation that they needed (Wynn, Engelke, & Swanson, 2009).

Medical-surgical nurses perform a synergetic role when they receive support during a call for RRTs, where the bedside nurse brought the patient information to the situation. The RN in a RRT team provides the knowledge and the skills for the consultation to medical surgical nurse, and achieves role synergy characterised by RN-RN consultation where what is achieved from interaction is greater than that achieved from the individual efforts. The role of synergy between RNs is to prevent adverse events from occurring during the rescuing process. A synergic role is an effective and an educational tool for both nurses and patient that supports junior and new graduate nurses, and to have the full picture about a patient who needs support and intervention. (Leach, Mayo, O'Rourke, 2010).

According to Wehbe-Janek et al., (2012) simulation experiences for bedside nurses have been used to increase their awareness of cases when a patient needs help. A

high fidelity simulator with realistic settings was used to identify valuable components for the nurse. The simulation program showed the relationship of the RRT associated with the patient outcomes. An increased familiarity with the equipment successfully increased their effective communication skills and gave them a sense of familiarity with the role along with its responsibility. Debriefing and reflective learning was used, and suggested a key future for such simulations for effective learning.

In medical-surgical nurses' experiences, the decision to call an RRT when they became worried for their patient was related to self-confidence. They would increase their awareness of the patient's condition in order to decide whether intervention from the RRT was needed (Jones et al., 2006).

Feelings experienced when calling an RRT differed from one nurse to another. Bedside nurses sometimes experienced a positive interaction with the RRT during the call, but while some of the nurses had positive views, others did not. A few nurses indicated that they felt afraid when they received criticism from an RRT after calling them. However, some nurses indicated that RRT calls were required because the medical management by doctors had been inadequate; many ascribed this to junior doctors and a lack of knowledge and experience. Some bedside nurses indicated that they would call the RRT if they were unable to call the covering doctor; however, a minority of medical-surgical nurses preferred to call the doctor if there was a critically ill patient before calling an RRT. (Williams, Newman, Jones, 2011).

According to Jones et al (2006) the majority of ward nurses indicated that calling RRTs prevents cardiac arrest, and 97 per cent said that the RRT intervention was intended to help and manage an unwell patient. On the other hand, a few nurses restricted their RRT calls because they were afraid of criticism about their patient care.

Nurses' views concerning the benefits of calling RRTs

According to Wynn et al. (2009), there were three main reasons to call RRTs from the bedside nurses' point of view. Around 78 per cent of the nurses surveyed (n=75) indicated that the primary reason they call a RRT is when there is a sudden change in the patient's vital signs. The second reason, indicated by 56 per cent of respondents, was when there was a steady decline in the patient's condition. The third reason, 35 per cent, was that no adequate response had come from the physician's side.

Some studies have shown that in most nurses' view, in their experiences, RRT helps critically ill patients when they have any early signs of deterioration (Astroth et al., 2013; Leach et al., 2013; Benin et al., 2012; Bagshaw et al., 2010).

An RRT promotes the assessment and treatment by providing a high level of knowledge and experience, as well as helping the nurse to prevent calling code blue to their medical-surgical ward. An RRT also transfers an ICU level of care to the patient in order to secure their safety. The participating nurses, from their own experiences, believed that RRTs could prevent critically ill patients from having a cardiac or respiratory arrest, and that they could prevent minor issues from becoming major and potentially life-threatening problems (Astroth et al., 2013).

Nurses thought that RRTs could help patients who were deteriorating fast, and cited this as the greatest advantage of RRTs. The participants described the RRT as a pair of eyes to assess the situation (Williams et al., 2011).

Bedside nurses receive immediate assistance and help for any patient in a life-threatening situation, with early intervention for critically ill patients to prevent cardiac or respiratory arrest. Furthermore, RRTs provide backup support for ward nurses when they are concerned or dissatisfied with their current medical management, or when the ward doctor is unavailable. This backup system gives them peace of mind in a clinical setting, and a sense of security in knowing that there is always a backup, providing the ward nurse with access to a medical expert who knows how to manage emergency situations (Salamonson et al., 2006).

The majority of medical-surgical nurse participants reported that they call the RRT if there is a complex medical-surgical issue. They also believed that calling the RRT would help to prevent a critically ill patient from having cardiac and respiratory arrest. A few nurses believed that they call the RRT because nurses have inadequate management (Bagshaw et al., 2010).

Knowledge and Skills of Bedside Nurses

A medical-surgical nurse identified that the RRT is a supportive team that provides guidance, education and continued follow-up for the patient's condition. None of the nurses noticed any discouragement from this team during calls. Furthermore, the unit culture of teamwork and the willingness to care for each other's patients during an RRT event gave them confidence, knowing that they would receive the needed assistance (Astroth et al., 2012).

The help from RRT and the improved skills through working as a team was immediately available through a single phone call for nurses, who were able to obtain additional help without having to request permission. The RRTs were the facilities' method of redistributing the workload for nurses (Astroth et al., 2012; Benin et al., 2012).

The support provided in calls to RRTs from medical-surgical nurses enhanced their skills and increased their knowledge and awareness in the processes of nursing

when they had critically ill patients. This especially benefitted new graduate nurses, allowing them to learn from the role of the RRTs. Some new nurses believed that calling the RRT represented a positive and collaborative experience that reinforces the use of teamwork. Patients also benefit from this team when intervention occurs quickly, and as some nurses noted, it helps them to practice their skills every day (Williams et al., 2010).

According to Wehbe-Janek et al. (2012), the simulation-training programme enhanced nurses' knowledge and skills relating to medical emergency situations. An RRT allowed them to identify their weaknesses and to learn from their mistakes or lack of knowledge, particularly in regards to the uncomfortable issues that they have to become familiar with during some proper procedures, such as using an algorithm and a crash cart. Other nurses felt that sharing ideas and tasks expedited the assessment process and ultimately improved the patient's condition at a faster rate.

Bedside nurses were satisfied with the collaboration with the RN RRTs, and noted that the outcome of the RRTs was often an improvement in skills and experiences. However, bedside nurses also wanted to be engaged with the team in order to provide better care for their patients, especially when the RRT call was over and they had to care for the patient remaining in the unit. Nurses noted that the RRTs brought about a greater sense of appreciation for the nurses after an RRT call, where some family members of a patient made positive comments about their support and how they helped to save lives. The opinion of the nurses in this study proved that they valued RRTs, and demonstrated the positive effects that the RRTs bring to their everyday practice. The implied positive effect is support and empowerment for nurses (Williams et al., 2010).

Some participants amongst medical-surgical nurses found that understanding the criteria for calling the RRT and knowledge were important to meet the patients' needs and to identify unstable patients. Education is important in providing skills that will help patients (Brown, Anderson, Hill, 2012).

Nurses' familiarity with using the criteria for calling the RRT

When a bedside nurse calls the RRT for a critically ill patient, he or she uses the criteria for calling the RRT based on his or her knowledge. Critical knowledge experiences are important in managing the crisis, and this is based on nurses' experiences (Galhotra et al., 2006).

According to Leach & Mayo (2013) medical-surgical nurses described that familiarity with the team leads to trusting behaviour between them when there is an urgent case.

The majority of participants expressed familiarity with the RRT criteria. Around 90 per cent of nurses thought that the RRT programme improved patient care, and around 84 per cent felt that the service improved the nursing work environment. Nurses who had called an RRT on more than one occasion were more likely to value their ability to do this (Pusateri et al., 2011).

The other nurses expressed that in their experience, the RRTs improved their practice, since they are supported by the RRTs when they know the criteria. Furthermore, they stated that they receive encouragement from the nursing leader and other co-workers. Participants in this study noted that they felt confident when they called an RRT. Medical-surgical nurses indicated that they received their education about RRTs during their annual competency review. A few noted that they did not receive any education on the RRT, other than when the RRT was developed. Participants believed that newly graduated nurses needed to be educated about RRTs in order to gain more awareness about when they should call this team and for what reasons (Astroth et al., 2012).

Communication Skills for Calling an RRT

Nurses enhance their communication skills as another valuable component of simulation training. Several participants described the RRT members' communication skills as being professional and caring. Both bedside nurses and the RRT members used the communication tool SBAR to collect information during the event, since this tool provides information both quickly and accurately. The participants noted that many of the RRT nurses provided emotional support. Others commented that they provide encouragement to bedside nurses, and use humour to defuse a tense situation. (Astroth et al., 2012).

In the case of an inadequately experienced bedside nurse, he or she is required to call the RRT in an emergency case, whereas other nurses would call the physician first when they have a sick patient. It was noted that 55.9 per cent from the total of 351 participants that they would call the RRT even if they were worried about any changes in the vital signs, in order to increase their knowledge through interaction with the RRT (Jones et al., 2006).

Common Challenges for Nurses When Calling RRTs

Knowledge and Experiences

A lack of knowledge and experience can lead to a lack of confidence and feelings of discomfort. Being faced with a need to exercise judgment and decide whether or not to call the RRT is a challenge for some bedside nurses when a medical-surgical nurse has noticed that a patient meets the criteria for calling an RRT. Furthermore, a lack of knowledge will lead to low quality of patient care (Schmid, Hoffman, Wolf, Happ, & Devita, 2013).

A few medical-surgical nurses were reluctant to call an RRT for fear of criticism from the RRT team when they responded to the call. (Jones et al 2006)

Conflict Between the Bedside Nurse and the Rapid Response Team

Working as a team is a major part of delivering good care to a patient and saving patients' lives. However, in the case of a conflict between the primary team and the nurses, or between the primary team and the RRTs, the bedside nurses attending felt that their plans for the patients were disrupted, resulting in disjointed care for the patient. This is a challenge concerning which team the bedside nurse will follow. As another study shows, these challenges are listed under the following two categories: direct challenge, when it is difficult to know when to call the RRT or not, and indirect challenge, when the RRT has been called and the question is who should take care of the patient during the RRT's call out (Shapiro et al., 2010).

Level of Education

Professionals who are to join RRTs need more education, training and understanding about the philosophy behind RRTs. Other challenges include the attitudes of RRT staff when they respond to calls from the bedside nurses. One nurse participant noticed that their individual's voice and communication style had a frustrated tone, which was not encouraging during the call out (Salamonson et al., 2006).

Traditional hierarchies and their relation to the physicians and supervisors impede some of the components of RN decision-making during rescue (Leach et al., 2010).

Other nurse participants identified that they were worried about calling RRTs because they felt afraid of criticism from them. Other nurses feared calling RRTs without the knowledge of the responsible nurses and physicians; nurses observed the reaction of the team, and this made them reluctant to call the RRT the next time. Other nurses described situations where they wanted to call RRTs, but were reluctant that they would be perceived as having neglected to give care to patients (Astroth et al., 2012).

Three different studies found that communication was a challenge when calling RRT members who did not exhibit a communication style that the nurses perceived as being supportive. According to the participants, their body language and method of questioning were perceived as negative and condescending. Moreover, their tone of voice was not encouraging to the bedside nurse. Furthermore, the lack of knowledge regarding the institution's policy on calling RRTs added a confusing barrier, making the nurse reluctant to make the call (Astroth et al., 2012; Jones et al., 2006; Baldwin et al., 2006).

According to Bagshaw et al. (2010) and Wehbe-Janek et al. (2012), there are other challenges facing nurses who want to call RRTs: they become frustrated with the delay in care when physicians are not present to assess their patients, and they have to resist calling the RRTs. Unavailability of assistance from co-workers created a demand for nurses to work around the clock, losing precious time when they should be providing care for their patient. Some nurses identified enhanced communication as another value of simulation training, since they were unaware of clear communication procedures. The lack of confidence and comfort flowed in the simulation where feelings were concerned.

Many nurses indicated that they would not call an RRT without calling a physician first, and some nurses feared that some doctors would shout at them when they called the RRT. 84 per cent disagreed or strongly disagreed that using an RRT system would increase their workload when caring for their patients. The poor attitude from some RRTs seems to require more education in order to deliver good communication between the team and the staff member who is taking care of the patient (Salamonson et al., 2006).

Discussion

Method

The literature review method was used in this study to compile and summarise findings; each article was read and critiqued separately and critically appraised starting with the title, year of publication, and abstract. Next, the whole article was analysed, including the background, aim, sampling method, data collection, data analysis, results, discussion and ethical approval. References were also checked for validity, credibility and reliability. The classification of each article was assigned following the guidelines of the quality grade (see Appendix II). This helped the author to choose the articles that best supported the aim. Most articles were grade I and the rest were grade II. Graded I articles included clear abstracts and clear processes of research, while grade II articles were less clear in some respects.

Ethical principles were used in the search process, including honesty, copyright for publication and avoiding any plagiarism or misconduct such as falsification and fabrication.

Some difficulties were faced when searching for articles in the PubMed database. Some articles provided more information but their year of publication was more than 10 years ago; other articles would not open. MeSh terms were used to find more articles relating to the topic and to address the aim of the study. The 15 articles represented research in different countries, but most focussed on US hospitals, while a few were conducted in Australia.

Other challenges during the time of this study included a lack of search results from the MeSh database; consequently, the free search in PubMed was used. All articles were published between the years 2005 and 2013. Some of the articles were randomised controlled trials (RCTs), whereas others were qualitative and prospective studies. (Poilt & Beck, 2012).

Results

This review looked at nurses' experiences and the challenges that medical-surgical nurses face when they call an RRT for an urgent patient case. During the analysis of all 15 articles, the results were categorised under the headings of 'experiences' and 'challenges'. All of these articles addressed the research questions and explored bedside nurses' experiences when calling RRTs. They found that the RRT is a helpful system for patients, and that bedside nurses felt supported by RRTs. However, there were some challenges that needed to be overcome in order to have a successful team delivering a good quality of care to the patient from the points of view of both medical-surgical nurses and the RRTs.

The themes of level of experience and qualifications largely reflected what the nurses experienced when calling RRTs. The findings emphasise that RRTs are an effective tool for patient care that saves patients' lives by preventing medical error and other adverse events (Winters et al., 2006; Brindley et al., 2007). However, there are many factors that can affect the performance of the system, including human error, poor communication, and deficiency in leadership, all of which could apply to the nursing team or the RRT (Raynard, Reynolds, & Stevenson, 2009).

The nurses' experiences with decision-making in trying to give quick and helpful intervention for patients focussed on the RRT for urgent and critical cases. Nurses are faced with the need to make a decision that requires years of experience combined with a high level of education. Nurses at the baccalaureate level with more than five years of experience had self-initiated calls to an RRT for urgent cases. Thus, education and experience are important when it comes to independent calling. Nurses who have more experience tend to have expertise in recognising and interpreting a situation, and are therefore better able to manage it. All hospitals have the responsibility to educate all healthcare professionals in order to improve the outcome for each patient. It is important to educate nurses about the RRT system, especially when it comes to new graduates (Wynn et al., 2009). Feelings of worry were major reasons for a bedside nurse to call the RRT, along with degree of empowerment and independent action by the nursing staff. Nurses need to know when and how to call an RRT in serious situations (White, Pichert, Bledsoe, Irwin, & Entman, 2005; Santiano et al., 2009).

Nurses' experiences when activating the RRT protocol differed according to their use of the RRT criteria,

different levels of education and diverse experiences. Some hospitals have their own protocol for calling the RRT, and this may be different from one hospital to another (Moldenhaure et al., 2009; Santiano et al., 2009). Decisions to call the RRT for critically ill patients by the bedside nurse are based on knowledge and the skills that come with years of experience and satisfaction with RRTs. This helps them to identify the best decision and when to call the RRT, but their qualifications also play a role in this (Metcalfe et al., 2008).

Medical-surgical nurses stated that RRTs provide important assistance when the early signs of deterioration are identified in order to prevent an adverse event so as to save patients' lives. RRTs also create a teamwork situation that generates communication among professionals, and this communication becomes more effective when a bedside nurse uses SBAR when reporting on the arrival of other team members (Beebe, Brinkley, & Kelley, 2012).

Poor communication between a bedside nurse and the RRT leads to an improper response. This indicates that poor communication is a barrier to engaging in effective action when a patient is critically ill, and that it is necessary to enhance nurse-physician communication to ensure that when a nurse calls an RRT, the response is appropriate. (White et al., 2005).

Medical-surgical nurses did not believe that RRTs are overused in hospitals, and other participants believed that interaction with the RRT did not increase their workload or decrease their skills when they gave care to a patient, but rather provided an opportunity for education (Jolly, Bendyk, Holaday, Lombardozzi, & Harmon, 2007). It was also considered that RRTs increase the knowledge of the bedside nurses indirectly through the following of simulation training, enhancing skills and awareness preparedness for emergency team events. This was amplified by the strong response that nurses have a better understanding of the roles of the RRT following training (Potter & Perry, 2008). RNs in RRTs have a synergetic role when it comes to both patients and bedside nurses. The American Association for Critical Care Nursing developed the synergy model, which defines some common characteristics for patients and nurses. (Hardin, Kaplow, 2005)

The patient characteristics are vulnerability, stability, complexity and predictability. Keeping these in mind, the nurse will be able to provide the best care according to patients' needs. In terms of vulnerability, nurses look for actual and potential stressors, whether physiological or psychological, which might affect patient outcomes. Highly vulnerable patients are susceptible to further deterioration and poor outcomes. Stability involves maintaining a steady equilibrium and assessing this characteristic means evaluating a patient's ability to respond to the treatment. Meanwhile, complexity involves the interaction of two or more systems, and is found when patients are treated for complicated diagnoses. Here, the nurse will

assess patients for their response to treatment and other unknown factors. Predictability is important when it comes to nurses' identification of a predictable path based on the disease progress and potential complications. Here, the nurse must synthesise patient data with disease management guidelines to ensure favourable outcomes.

The nurse characteristics are clinical judgment, advocacy and moral agency, caring practice and collaboration. Clinical judgment is clinical reasoning which includes decision making, critical thinking and the global grasp of a situation according to experiential knowledge and evidence-based guidelines. When registered nurses are not part of an RRT, this team educates bedside nurses' in relation to their clinical judgment through physical and data assessment techniques that are anticipated to be helpful for the patient. Such tools are useful for critical care nurses when they are unfamiliar with these techniques. In terms of advocacy and moral agency, a nurse will demonstrate moral agency by working on the behalf and representing the concerns of the patient. As an advocate, the RRT nurse will be able to direct patient-centred care and ensure that patients' wishes, dignity and rights are preserved. Moreover, in this way, the team will provide support to patients and family by offering clear information about the patient's condition. The RRT also helps bedside nurses to promote decision-making. The team acts as a conduit to exchange information amongst the nurse, family and patient. Collaboration involves working with others such as physicians, families and healthcare providers in a way that promotes and encourages effective care. Each team must respect the other teams and the role they play in ensuring that their patient has a positive outcome (Hardin & Kaplow, 2005).

The implementation of the RRT in a hospital to save patients' lives distributes the work across a team of bedside nurses, physicians and RRT members. The RRT increases the sense of security among medical-surgical nurses when managing an unwell patient and this may translate into more confidence and empowerment for the nurse (Jolly et al., 2007).

Some bedside nurses noted that they learn new skills from interactions with RRTs, while some observed that they want to have a special programme concerning the RRT in order to understand when to make a call (Brown et al., 2012). Team communication and information sharing is a critical part of team behaviour; the Joint Commission report indicated that communication failure is a root cause of essential events (The Joint Commission, 2007). Communication is thus important in delivering good care. The following three main factors are associated with communication failure: (i) Physicians and nurses are trained to communicate differently; (ii) the hierarchies within the health care systems frequently inhibit people from speaking up; and (iii) the communication and the providers in health care (Leonard, Graham, & Bonacum, 2004).

Medical-surgical nurses and physicians need to work as a team and accept each other's ideas. Teamwork results in the delivery of good care to patients, as the patient is the main concern for nurses, physicians and the RRT. Some nurses stated that when faced with a patient who meets the criteria for an RRT, they should call a responsible physician before calling the RRT itself. This result suggests that the nurse would prefer to use diplomacy instead of calling the RRT. However, if there were no physician available, the participants indicated that they would call the RRT (DeVita et al., 2006).

Some physicians believe that the RRTs interfere with their plans, and this finding suggests that more education for both nurses and physicians is needed regarding the role of RRTs (Jolly et al., 2007). On the other hand, delays in quick intervention relating to the lack of a clear understanding about roles of RRTs have been a problem when it comes to taking responsibility for whether or not an RRT should be called. It has been suggested that simulation training clarifies this role and increases awareness and preparedness (Villamaria et al., 2008).

Education and teaching for bedside nurses will improve their skills when it comes to calling the RRT for their patients without the feeling of criticism. More extensive education is needed in order to remove the feeling of hesitation in calling the RRT (Pustateri, Prior, & Kiely, 2011).

Conclusion

Medical-surgical nurses call RRTs to help save patients' lives, and their decisions depend on their prior experience. Medical-surgical nurses and RRTs need to collaborate during the delivery of care to patients. Both need to have knowledge and good communication skills in order to identify the deteriorating clinical signs that require intervention and to deliver fast intervention to a critically ill patient.

The experiences of bedside nurses who have become familiar with the signs of a deteriorating patient and who know the criteria for calling RRT play a major role. Years of experience and levels of qualification are crucial in a nurse's decision to call the RRTs or to refrain from doing so. Furthermore, the communication and attitude of the bedside nurse and the RRT member play a large role in delivering clear information. Finally, the patient needs help and protection from any adverse event which could occur while receiving care in hospital. An RRT is a helpful tool for hospitals to apply, and can be used to educate staff. When a patient stays in the hospital because of a medical error, this team is needed.

Clinical Implications

The author found that, when employing RRTs in a hospital setting, it is important to focus on educating new staff alongside all nurses and physicians who have prior

experiences with RRTs. They should be given strategies on what their role will be when they are faced with the need for emergency care. Education about RRTs is important in order to avoid miscommunication and misunderstanding between the staff that take care of patients' wellbeing.

Recommendations for Further Studies

The author found that more studies regarding medical-surgical nurses' perspectives on education are required in order to address the challenges facing new staff when they call RRTs to save their patient's life. Additional studies should also focus on the area of improving communication among the members of the medical-surgical team and on communication attitudes.

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Appendix 1

Author(s) Year Country	Title	Aim/Objective	Method	Participants (attrition rate)	Results	Design Quality
Shapiro, S., Donaldson, N., & Scott, M. (2010) San Francisco, USA	Rapid Response Teams as seen through the eyes of the nurse	To explore the impact of the Rapid Response Teams from the perspective of the nurses who use them to give voice to the nurses' experiences	Mixed methods; qualitative & quantitative	N=56 From 18 hospitals, 13 states (0)	Experiences: —The participants call this team when they notice that a patient has clinical changes to his/her condition that needs an intervention from the RRT. —Some nurses noted that the RRT is the extra eyes, hands, and bodies that are used to help the patient meet the patient's immediate needs. —Staff nurses noted that calling the RRTs is a solution to expediting care for patients with urgent call. Challenges: —Direct challenges: difficult to know when to call the RRT, and when a nurse is going to call or not. —Indirect challenges: medical-surgical nurses who call the RRT are concerned about who would take care of their patient from RRT.	I
Salamonson, Y., Ven Heere, B., Everett, B., & Davidson, P. (2006) Australia	Voices from the floor: nurses' perception of the medical emergency team	To explore the nurses' satisfaction with the MET, the perceived benefits of having a MET system and suggestions for improving the system; to examine the characteristics of nurses who were more likely to activate the MET	Quantitative study using open-ended survey questions	N=92(73)	Experiences: —From 10 percent–16 percent of bedside nurses who have 0–5 years were less experienced calling RRT. —Around 9 percent–21 percent of nurses who have more than 11 years have experiences of calling RRT. —Participants noticed that the benefit of calling the RRT is that they intervene quickly, offer backup, support, and access to medical experts. Challenges: Bedside nurses were satisfied with the MET but they suggested more education for junior staff on the MET; some suggested improving the team by changing their poor attitude.	I Quantitative
Benin, A. L., Brogstrom, C. P., Jenq, G. Y., Roumanis, S. A., Horwitz, L. (2012) Australia	Defining the impact of a rapid response team: a qualitative study with nurses, physicians and hospital	To describe the experiences of the attitudes held by the nurses, physicians, administrators and staff regarding the RRTs	Qualitative study, open-ended interviews	Qualitative study, open-ended interviews	Experiences: There are positive and negative implications: the positive from the moral and teamwork support and empowerment of the bedside nurses, where both nurses and physicians used the RRT if there are any changes in vital signs in the patients that need an intervention from the RRT. The learning tool could support junior nurses. Challenges: —Workload, the redistribution of nurses' workload during emergent care, giving a process that might affect patient care. —Conflicts between the primary team and the nurses and between the primary team and the RRT. Negative impact for the education of house staff, burden of work for the RRT, error and delay due to the lack of continuity.	II

Author(s) Year Country	Title	Aim/Objective	Method	Participants (attrition rate)	Results	Design Quality
Leach, L., Mayo, A., & O'Rourke (2010) California, USA	How RNs rescue a patient: a qualitative study of the RNs' perceived involvement in Rapid Response Teams	To investigate how the RNs rescue patients in hospitals where RRTs are in place	Qualitative study, semi- structured interview	N=50 (0) 14 bedside nurse staff RN, 16 RRT staff RN, 18 nurse supervisors who had observed RRT	Experiences: —RN's viewed the RRTs as being helpful, supportive and effective safety interventions; they prevent adverse events during the rescue process. —The decision-making of the RN involvement as a part of the rescuing process. —The rescuing process carried out by RN engaged in the RRT intervention. —RN-RN consultation was a source of role synergy, where role synergy increased the gain achieved from the interaction and the cooperative focus on need. The urgency of the circumstance is greater than those achieved through individual efforts. —The RN-RN role synergy was a value added that contributed to preventing adverse events. —The RN uses their knowledge of the RRT trigger protocol to make a thought decision-making process the RN uses in rescuing patients. Challenges: The RRT intervention was not always smooth in terms of the RN decision-making, minor conflict and barriers which emerged while there were different types of decision making happening.	I Q
Brown, S., Anderson, M., Hill, P. (2012)	Rapid Response Team in a rural hospital	To explore the nurses' knowledge and perceptions of the Rapid Response Team	Quantitative, prospective, descriptive design	N=57(0)	Experiences: 23 per cent of nurses known to call RRT and follow the criteria. Bedside nurses call RRT without involving the physician's opinion, and nurses can call if they are worried about their patient, or if patients meet the criteria. Challenges: There are some barriers to calling RRT, including physician opinion that RRTs were not particularly important to the nurse, and RRTs demanding to the person calling, and they give impetation to nurses not to call again.	II Quantitative
Astthroth, K., Woith, W., Stapleton, S., Degitz, R., & Jenkins, S. (2013) USA	Qualitative exploration of the nurses' decision to activate rapid response teams	To identify the barriers and facilitators of the nurses' decisions regarding the activation of the Rapid Response Teams in hospital	Qualitative study, semi- structured	N=81(0)	Experiences: —The participants believed that the RRTs are experienced and training enables them to manage seriously ill patients more effectively. —Participants indicate that the RRTs are supportive, provide immediate assistance. —The communication with the RRT is professional, use of SBAR tool which provides information quickly and accurately. —Participants said that the RRT nurses provided help and emotional support, there is no one who discourages them when they call, and they feel confident in calling. The education of the RRT is contradictory according to participant experience. Challenges: —Some of participants noted that RRT members did not exhibit a communication style that was perceived as supportive;	I Q

Author(s) Year Country	Title	Aim/Objective	Method	Participants (attrition rate)	Results	Design Quality
					<p>participants felt that the communication style of some individuals in the team were abrupt and disconcerting to the unit nurses.</p> <p>—Some participants noted that some of the RRT members sought out the necessary information from staff, but their body language was negative.</p> <p>—Some participants noted the tone of voice of RRT nurses did not give the impression of help, and the participants did not always feel that supported. The communication of body and voice becomes a challenge to the bedside nurses with the attitude of the RRT members; when they call they ask why are they calling.</p> <p>—Some of the participants believe that they should call an attending physician first, because some physicians will be unhappy if the RRT is called and they were not; some physicians reprimanded bedside nurses when they called the RRT.</p>	
Bagshaw, S. M., Mondor, E. E., Scoutten, C., Montgomery, C., Slater-MacLean, L., Jones, D. A., Bellomo, R., Gibner, R. T. (2010) Canada	A survey of nurses' beliefs about the medical emergency team system in a Canadian tertiary hospital	To evaluate the nurses' beliefs and behaviours about the Medical Emergency Team system in Canadian tertiary hospital	Qualitative study	N=614 ()	<p>Experiences:</p> <p>—Medical surgical nurses believed that MET provides benefit that could prevent critically ill patients from having cardiac arrest or respiratory arrest, and that could prevent minor issues from becoming major or potentially life-threatening problems.</p> <p>—94 percent of nurses thought that the MET obtained help for their patients when they were worried about them.</p> <p>—Several nurses indicated that the MET was supportive in the promotion of an enhanced level of patient care, also providing education and management of care to nurses outside of the ICU.</p> <p>Challenges:</p> <p>Some nurses were reluctant to call MET because of their fear of criticism. Most who responded felt afraid to call MET because of their knowledge, and they prefer to call the physician first.</p>	I Q
Williams, D. J., Newman, A., Jones, C., Woodard, B. (2011) North Carolina, USA	Nurses' perceptions of how Rapid Response teams affect the nurses, team, and system.	To describe the perceptions of nurses who use an RRT at community hospitals.	Qualitative phenomenological study; focus group	3 medical-surgical nurses, 28-bed cardiac care unit, 42-bed medical-surgical unit, 12 observation unit.	<p>Experiences:</p> <p>—Participants who were medical-surgical nurses showed that the RRT is an effective tool in patient care, a supportive and helpful team to patients.</p> <p>—RRTs developed nurses knowledge; RRTs benefit patients; they experience autonomy and use intuition.</p> <p>—Nurses perceive that RRT solves problems collaboratively, and praises the team. This team helps nurses to do systematic work for patients and processes advocating patient safety.</p> <p>Challenges:</p> <p>When the nurses saw the reaction during RRT calls, this made the nurses reluctant to call this team next time.</p>	I Q

Author(s) Year Country	Title	Aim/Objective	Method	Participants (attrition rate)	Results	Design Quality
Galhotra, S., Scholle, C., Dew, M., Mininni, N., Clermont, G., & DeVita, M. (2006) Pennsylvania, USA	Medical emergency teams: a strategy for improving patient care and nursing work	To understand nursing perceptions about medical emergency teams and their impact on patient care and the nursing work environment at an acute care teaching hospital in the USA	Questionnaire, survey	N=300 (52)	Experiences: —Participants had positive attitudes toward MET. —98 per cent of nurses familiar with MET activating criteria. However, 60 per cent had low awareness of the availability of MET information. —93 per cent of nurses say the MET improves patient care. 84 per cent of nurses say the MET response improves the nursing work environment. 98 per cent feel value when they call a MET.	I Quantitative
Wynn, J., Engelke, M., & Swanson, M. (2009) North Carolina, USA	The frontline of patient safety: staff nurses and Rapid Response Team calls	To examine the relationships between nurses' educational preparation, years of experience, degree of engagement, and the RRT call status (independent vs. dependent)	A descriptive, cross-sectional, correlational design	N=75 (0)	Experiences: —The participants noted that they called the RRT when they noted some critical changes. —Different experiences with three years' experience or more and BSN nurses compared to others with less experience. Challenges: Communication is become a barrier to effective action upon the clinical signs.	I Quantitative
Jones, D., Baldwin, I., McIntyre, T., Story, D., Mercer, I., Miglic, A., Goldsmith, D., Bellomo, R. (2006). Victoria, Australia	Nurses' attitudes to a medical emergency team service in a teaching hospital.	To assess whether nurses value the MET service and to determine whether barriers to calling the MET exist in a 400-bed teaching hospital.	Qualitative, focus group.	N=331(0)	Experiences: —91 per cent responded that they understand the benefit of MET. —93 per cent agree that the MET prevents escalating minor to major issues. —7 per cent agreed that the MET is required in hospitals because they provide management for critical ill patients. —86 per cent disagree that the MET is overused in management in hospitals. —93 per cent disagree that they don't like to call MET because of criticism for not looking after their patient. —72 per cent agreed that they would call the physician before calling MET. Challenges: One of the barriers is the reluctance for nurses to call the MET for a critically ill patient. They fear criticism that the patient was not looked after well enough.	I Q
Pusateri, M. E., Prior, M. M., Kiely, S. C. (2011) USA	The role of the non-ICU staff nurse on a medical emergency team: perceptions and	To understand the role of nurses, and possibly to increase the effectiveness of these teams, we sought to determine the nursing staff's familiarity with and perceptions of the MET at one hospital.	Quantitative study	N=388 (131)	Experiences: —97 percent are familiar with the MET; 17 percent aware about this team at hire. —76 percent had been hired before the hospital had implemented the MET. —31 percent hesitated to call MET because physicians discourage them. —92 percent agreed that MET improves patient care. —83 percent agreed that MET improves their work. —Educational effort is needed as the Rapid Response system has yet to be fully understood and integrated into hospital culture.	II

Author(s) Year Country	Title	Aim/Objective	Method	Participants (attrition rate)	Results	Design Quality
Pusateri, M. E., Prior, M. M., Kiely, S. C (continued)					Challenges: The communication and relationship between bedside nurse and RRT needs to improve; there is some frustration.	
Leach, L. S., Mayo, A. M. (2013) USA	Rapid response team: qualitative analysis of their	To describe effectiveness of rapid response team	Qualitative	N=17(0)	Experiences: RRT is an effective team, their performance include organisational structure, team work, managing the crisis, and improve communication Challenges: Lack of confidence and comfort when calling RRT.	I Q
Wehbe- Janke, H., Lenzenmeier, C., Ogden, P., Lambden, M., Sanford, P., Herrick, J., Song, J., Pilego, J., & Colbert, C. (2011) Texas, USA	Nurses' perception of simulation-based inter-professional training program for Rapid Response and code blue events	Explore nurses' perceptions of simulation-based inter-professional training program for the Rapid Response team	Mixed methods of study between qualitative and quantitative	N=360 (0)	Experiences: —32 per cent agree with increased awareness and preparedness. —27 per cent of nurses had enhanced understanding of the responsibility for each role during RRT. —27 per cent agreed with improved team work. —21 per cent increased their knowledge and skills. —13 per cent increased their confidence and comfort. —14 per cent improved simulation of experiences. —13 per cent debriefing and reflective learning. —Debriefing and reflection in learning occurred when following the simulation training. The nurses called the code and received feedback on the positives and negatives of the codes, taking the time to review what they learnt. —The simulation program showed the relationship of the RRT to the associated patient outcome. The nurses' response was that the simulation of their experiences helped to increase their familiarity with the equipment used during resuscitation. —Clinical simulation experiences gave them the opportunity to increase communication skills and perform teaching skills.	I Qualitative and quantitative
Schmid, M., Hoffman, L. A., Wolf, G. A., Happ, M. B., & Devita, M. A. (2013) USA	The use of medical emergency teams in medical and surgical patients: impact of patient, nurse, and organization	Examine differences in patient, nurse and organizational response	Quantitative study	N=108(0)	Lack of familiarity with patient problem could influence low of patient outcome	II Quantitative

Appendix 2 (Next page)

The classification guide for academic articles and studies regarding the quality in both quantitative and qualitative research, modified from Berg, Dencker, and Skärsäter (1999) and Willman, Stoltz, and Bahtsevani (2006).

CLASSIFICATION	GRADING OF ACADEMIC QUALITY		
	I = High quality	II = Moderate quality	III = Low quality
Randomised controlled trial (RCT) is a prospective study that entails a comparison between a control group and one or more experiment groups.	Large, well-planned and well-executed multicentre study with an adequate description of protocol, materials and methods, including treatment techniques. The number of patients/participants is large enough to answer the research question. Adequate statistical methods.	•	Randomised study with few patients/participants and/or too many partial studies with insufficient statistical strength. Insufficient number of patients/participants, inadequately described method or large attrition rate (participant dropout rate).
Clinical controlled trial (CCT) is a prospective study that entails a comparison between a control group and one or more experiment groups. Not randomised.	Large, well planned and well executed study with an adequate description of protocol, materials and methods including treatment techniques. The number of patients/participants is large enough to answer the research question. Adequate statistical methods.	•	Limited number of patients/participants, methods inadequately described, faults or lacking in protocol and insufficient statistical strength.
Non-controlled study (P) is a prospective study, but without a control group.	Well-defined research questions, sufficient number of patients/participants and adequate statistical methods.	•	Limited number of patients/participants, method inadequately described, faults or lacking in protocol and insufficient statistical strength.
Retrospective study (R) is an analysis of a historical material relating to something that has already happened, such as patient charts.	Number or patients/participants sufficient to answer the research question. Well-planned and well-executed study with an adequate description of protocol, materials and methods.	•	Limited number of patients/participants, method inadequately described, faults or lacking in protocol and insufficient statistical strength.
Qualitative study (Q) often is an investigation where the aim is to study phenomena or interpret meaning, perceptions and experiences from the perspectives of the participants. The aim can also be to develop concepts, theories and models.	Context clearly described. Selection of participants motivated. Clearly described selection criteria, data collection, transcription process and method of analysis. Credibility and reliability described. Relation between data and interpretation evident. Critique of method.	•	Poorly formulated research questions. Patient/participant group inadequately described. Method and analysis not sufficiently described. Presentation of incomplete results.