

Effect of implementing rapid response in tertiary hospital



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The Effects of Implementing a Rapid Response Team in an Omani Tertiary Hospital

Abstract

Rapid Response Team (RRT) is the delivery of direct care for deteriorating patients. Additionally, it is to follow up the patients who are recently transferred from the intensive care units and are at risk for deterioration in their health condition (Moody and Griffiths 2014). The RRT improves patients' outcomes, such as patients' conditions, reduction in readmissions and mortality rates (Cutler et al. 2012). The main objective is to examine the effect of the RRT service in the Royal Hospital, Oman on patients' outcomes as there is a dearth in researches in the country about the topic. A pre-experimental research approach and a pretest and posttest with comparison group design will be used.

Introduction

A Rapid Response Team (RRT) defined as a group of practitioners trained to transfer critical care practice to a patient outside the critical care unit (Institute for Healthcare Improvement [IHI], 2008). RRTs are one solution introduced into a health care system to decrease patient readmission rates to the intensive care units (ICU), and the cost of the treatment in those departments. The implementation of an RRT has an impact on improving patient outcomes, including improvement in patients' conditions, reduction in readmissions, and reduced mortality rates (IHI, 2008).

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ICUs and acute care departments admit a huge number of patients with complex conditions and variety in their health stability status. This situation has prompted the governments of several countries to try to resolve or minimize the magnitude of related problems, such as high mortality rates and treatment expenses (Adhikari, Fowler, Bhagwanjee, & Rubenfeld, 2010). The need to handle such issues prompted the creation of the RRT service. RRT services have different names in different countries, such as Medical Emergency Team (MET) in Australia and Critical Care Outreach Team (CCOT) in the United Kingdom (UK) (Moody & Griffiths, 2014).

The UK is an example of a country with increased RRT use. In recent years, financially outlays for critical care departments have increased by 10% annually. Specifically, an increase in the cost of following up the patients who recently transferred from the intensive care units and are at risk for deterioration has reoccurred (Moody & Griffiths, 2014). Another indicator is the rising cost that resulted from the increasing number of readmissions to critical care units. Another likely cost factor is that nurses are using high technology equipment and tools in such working areas compared to the general wards. For example, nurses are frequently using respiratory ventilators, cardiac monitors, and infusion pumps. Significantly, as nurses use more high-tech equipment, the overuse of such equipment leads to greater expense from the required maintenance (Evans, 2013; Moody & Griffiths, 2014).

Early, in the 1990s, the same issue was encountered in Australia (Carter, 2008). There was an increasing number of readmissions to ICU and a rise in the mortality rates, which led the health sector to establish the Medical
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Emergency Team (MET). This service focused on more efficient management of the detection of problems and the implementation of services which aim to reduce the mortality rates and to minimize the treatment expenses.

Because of the limited scientific research related to the topic, the establishment of the MET was not based on evidence-based practice (Carter, 2008). This limitation inspired the need to track the problems in the clinical areas and to try to find a route to resolve them scientifically. Alternatively, the work overload and the aim to save patients' lives necessitated the implementation of new services to tackle some problems (Moody & Griffiths, 2014). These points suggest that there is a need to conduct scientific research and to demonstrate the effectiveness of such services, mainly in increasing the survival rate.

Gulf countries such as Saudi Arabia and the United Arab Emirates have no evidence of the existence of the RRT in their health care system. In Oman, on the other hand, the Royal Hospital in 2010 adopted the service used in the UK and implemented the CCOT (RRT) service. Royal Hospital Statistics (2013) showed that the implementation of the RRT resulted in a significant improvement in patient survival rates as well as nursing critical care competencies (Royal Hospital Annual Report, 2013). The aim was to provide a high quality of care and more promptly manage the deterioration of patients in the general wards. One result that showed a significant impact of the service was that the number of cardiac arrest incidents in general nursing departments was reduced from 63 cases in 2011 to 29 in 2013. This resulted in a decreasing number of readmissions to the ICU (Royal Hospital Annual Report, 2013).

Statement of the Problem

Many countries noted the positive effect of the RRT service implementation demonstrated by reductions in mortality rates, cardiac arrests, readmissions to ICUs, the length of ICU stays and in the severity of patients' conditions. In Oman, there is a dearth of research related to the topic of this proposal. No study was found that addressed RRT implementation or that discussed the impact of this service in Oman. Since Oman has a different health care system and different culture from previous studies, the effect of RRT service on the patients' outcomes in Oman needs to be examined.

Purpose

The goal of this study is to explore the effect of implementing the RRT service on patients' outcomes in a community-based hospital in Oman.

Literature Review

The Cumulative Index to Nursing and Allied Health Literature (CINAHL) Complete Database was used to search for relevant studies. The search was limited to English-language, peer-reviewed articles, and published between January 2011 and March 2016. The search terms used were " rapid response team" AND " usual practice" AND " patients' outcomes." The original purpose was to make the search regional and limited to Oman. However, no articles could be found for Oman, nor for " Gulf Countries" or even for " Arab Countries." Though, the decision was made to remove the area limits. To have articles from different countries the term " Critical Care Outreach

Team" was searched and two related studies were also included in the literature.

RRT Effectiveness

The effective RRT service needs many elements which help to reach the desired outcomes. For instance, the Institute for Clinical System Improvement (ICSI, 2011), emphasized on the need to accompany the patient by one of the RRT members to the ICU and hand over the report and the documents to the ward nurses. This recommendation is a good step to support care continuity and to have better outcomes. The authors stated that in order to support the RRT a physician must go with the team (ICSI, 2011). However, the RRT service has many positive impacts on the patients and the facility. ICSI, (2011) guideline emphasized the positive effect of reducing cardiopulmonary arrests, post-operative ICU admissions, and mortality rates. Massey et al., (2010); Frey (2012); Evans (2013); Moody and Griffiths, (2014); White et al., (2015) stressed on the same outcomes which could be accomplished through the RRT service.

Assessment of patients' conditions and EWSS tool

The evolution of the RRT was due to the lack of critical care experience among the staff in the general units. Patients often had signs and symptoms that could be detected six to eight hours before the development of cardiac arrest (Frey, 2012). Several reasons prevented the delivery of the necessary care for patients whose condition was deteriorating. Some examples were a lack of communication skills, inability to recognize the deteriorating conditions, and staff reluctance to call for help (Frey, 2012). White et al., <https://assignbuster.com/effect-of-implementing-rapid-response-in-tertiary-hospital/>

(2015) supported the same points, as they found the patient's deterioration could be detected six hours before the onset of cardiac arrest. On the other hand, White et al., (2015) suggested that an RRT should have three working points to save the patient's life: the early assessment, early RRT activation, and early RRT response.

Early Warning Scoring System (EWSS) is a tool used to assess the patients' conditions ahead of time which helps in detecting any changes or deterioration in patient's health status. However, the ICSI (2011) guideline recommended using the EWSS in detecting patient deterioration. In addition, the document presents a list of recommendations, which are important for the nurses to understand. For examples, how to prepare the EWSS and how to implement the RRT. However, White et al., (2015) suggested that the use of the EWSS could trigger the RRT at the appropriate time to save patients' lives. Moreover, Pattison & Eastham (2012) found a significant correlation between the use of the Modified Early Warning System (MEWS) and the survival rate. Though, it is critical to have such kind of tool to implement a good RRT service.

RRT activation

When to activate the service is a question which might make the medical personnel in confusion and do not have the confidence when to activate it. Pattison and Eastham (2012) conducted a mixed-method examination, designed to study the referrals to the CCOT (RRT) regarding the factors affecting the management process and the potential for discharge. The authors concluded that the medical staff made the major referrals to the

CCOT, and the seniors made more calls than the juniors did (Pattison & Eastham, 2012). However, the study found the main time for the referrals was between 9 am and 5 pm which was due to the availability of the nurses and the handing over time as the nurses have to take around while handing over the shift. A significant finding was the 95% of the calls were delayed about three hours between the deterioration time and the referral to the CCOT (RRT). Some of the experienced staff were not following the MEWS tool. Instead they were using their judgment to decide when to call the CCOT. On the other hand, inexperienced staff triggered the CCOT more frequently than the experienced staff (Pattison & Eastham, 2012).

Any service could have pitfalls or weak structure which exposes its success into danger. The failure to call the RRT is one of the reasons leading to a negative impact of the RRT (White et al., 2015). Moreover, the work overload is the main barrier to calling for CCOT help (Pattison & Eastham, 2012). Furthermore, the nurses should have the confidence in the positive effect on patients' conditions after the RRT intervention. Furthermore, the delay in activating the RRT could have been due to the nurses' decision to call the doctor and inform him about the patient's condition (Astroth et al., 2013). However, Humphreys and Totapally (2016) found the RRT was activated more frequently during the day shift compared to the night shift. The authors thought the reason was due to the availability of the nurses and the rounds the nurses perform during shift handover. Moreover, the authors explained that the reason was that the service was not activated as it was supposed to be.

RRT evaluation

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The RRT service should be evaluated and assessed continuously trying to detect any weakness in the service. Massey, Aitken, and Chaboyer (2010) conducted a comprehensive literature review to expand the knowledge of the RRT and to find proper ways to implement the service, by exploring the effect of this service on minimizing patients' outcomes while going through the deterioration process. The study found no particular instrument used to evaluate the effectiveness of the RRT. Moreover, it is suggested to have a consistent tool to assess the RRT effectiveness. The health care staff and the administration should work together to form a well-organized RRT (Frey, 2012). This highlighted the need to develop a scientific tool to assess this type of service to help in improving it. Furthermore, Leach and Mayo (2013) emphasized the need to have an internal evaluation strategy to examine the efficiency of the RRT services. This was supported by Leach and Mayo (2013) as they claimed that there should be a continuous evaluation of how the staff understands the importance of the RRT service as a requirement.

Training for RRT and Communication Skills

According to Frey (2012), there are some points the floor staff should follow. The staff have to be well trained in how to assess the patients' conditions; they should know the RRT protocol and the staff should feel more confident to call the team without any fear of misjudgment. On the other hand, the RRT should be assigned only to respond to any call in any department without any other assignments. In addition, the RRT has the responsibility to help the floor nurses to stabilize the patients, to teach and train the floor nurses in assessing any deterioration, and to take part in transferring the patient from the floor to the ICU. Furthermore, the authors reported that the <https://assignbuster.com/effect-of-implementing-rapid-response-in-tertiary-hospital/>

nurses were not activating the system in proper time for the RRT services and that some health care workers were not utilizing the service in a proper way. Their emphasis was on the need for conducting appropriate training for medical personnel (Massey et al., 2010). However, Astroth et al., (2013) suggested following a formal RRT training procedure in any institution. If the employees are educated on the topic, it could help to improve the quality of the service. Furthermore, Leach and Mayo (2013) recommended immediate feedback to the team members, as this helps them to learn from the situation and make required improvements. In addition, Furthermore, due to the effectiveness of this service, there is a need to hire more staff for this team and to improve the training to involve all the members, including the physicians and paramedics with the nurses. Moreover, the RRT team should teach the unit's nurses how to detect deterioration, as this could help in the early detection of any complications (Oliveira Dias et al., 2015). This was supported by Humphreys and Totapally, (2016) as they concluded in their study that the employees needed more training about how and when to utilize the RRT service.

. The RRT members' capabilities, experience, and professional communication skills encouraged unit nurses to call the team for any help needed in case of any deterioration in patients' conditions (Astroth et al., 2013). Additionally, Leach and Mayo (2013) found the effective communication is an important aspect that needed to be improved among the multidisciplinary team, including the RRT. However, Oliveira Dias et al., (2015) emphasized the importance of the nurses' involvement in this service,

as they were responsible for detecting the patient's condition, in particularly any deterioration.

Summary

The reviewed articles and the studies shared the same independent variable, which is the RRT (CCOT). On the other hand, different concepts were developed in the studies. The concepts included RRT implementation's outcomes, barriers and facilitators, activation timing, evaluation, teaching, and enforcement components.

All the studies demonstrated the positive effect of implementing the RRT service. The effects included the reduction of mortality rates, cardiopulmonary arrests, ICU readmission rates, and further complications from deterioration. The investigators emphasized the importance of staff training, communication skills, assessment of patients' conditions, and what is the proper method to activate the RRT. They noted these were key elements to having a successful RRT (IHI, 2008; Massey et al., 2010; Frey, 2012; Astroth et al., 2013; Leach & Mayo, 2013; Humphreys & Totapally, 2016).

IHI (2008), Pattison, and Eastham (2012), Moody and Griffiths, (2014), Oliveira Dias et al., (2015), and White et al. (2015) emphasized the use of the EWSS tool when assessing patients to detect any deterioration. Frey (2012) suggested having a standard tool to evaluate the team performance and the effectiveness of the service. Moreover, the author mentioned the lack of communication skills, inability to recognize the deteriorating

conditions, and staff reluctance to call for help as reasons behind the failure in activating the RRT.

Oliveira Dias et al. (2015) looked into the core elements that were important to be included in the RRT service with the goal to perform a successful task. The vital factor was the presence of the nurses with the team. The other elements included the well-prepared emergency cart, some essential equipment, and continuous evaluation of patients' conditions in the general wards. Moreover, they saw a need for more team members, 24 hour RRT service, and good orientation for the members of the ICU physical structure. However, since the health care system in Oman is different from the other countries and because of the difference in the culture, the published studies cannot be assumed transferable to Oman health care system. So this study proposal will examine the effect of the implemented RRT service in the Royal Hospital, Oman on patients' outcomes.

The Research Question:

In Oman Royal Hospital, is there a difference in patient outcomes between the implementation of the RRT service compared to the usual practice?

Null Hypothesis

There is no difference in patient outcomes in Oman Royal Hospital between the implementation of the RRT service compared to the standard practice.

Research Hypothesis

There is a positive impact on patient outcomes in Oman Royal Hospital for the patients received the RRT service compared to the patients received usual practice.

Identification of Study Variables

This study proposal will use type of care as the independent variable. The variable varies in two ways, the RRT service and the usual practice as the independent variable. The dependent variables will be the patients' outcomes. The outcomes include the patients' mortality rate, cardiopulmonary arrest, ICU readmission rate, and ICU length of stay. The conceptual definitions are illustrated in Table 1.

Method

Design

The research will use pre-experimental research approach and a pretest and posttest with comparison group design; this approach aims to study specific outcome before and after introducing a particular intervention (Fain, 2013). It answers the research question by assessing the effectiveness of the RRT on one patient outcome and compares the results on the outcome before the implementation of this service on another group of patients in Oman, Royal Hospital. The researcher will not control patients who received RRT service, as the goal is to measure the changes in patients' outcomes following receipt of the RRT.

Use of the pre-experimental approach with a pretest and post-test design

and a nonequivalent comparison group is the appropriate design for this
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study (Grove, Burns, & Gray, 2013). The pretest and posttest with comparison group design examines one independent variable how it affects one group of people's outcomes (Taylor, Kermode, Roberts, & Roberts, 2006).

In this study, the design with a comparison group assesses the outcomes (mortality rate, cardiopulmonary arrest rate, ICU readmission rate, and ICU length of stay) of one group of patients before implementing the RRT, then assesses the same outcome of the intervention (RRT) in another group of patients. The data will be obtained from patients' medical records; however, the data could be obtained from the facility's electronic databases (Grove, Burns, & Gray, 2013). This pretest-posttest with a nonequivalent comparison group study will permit the researcher to assess the impact of implementing the RRT on patients' mortality rate, cardiopulmonary arrest rate, ICU readmission rate, and ICU length of stay in the Royal Hospital, Oman.

Royal Hospital, Oman, uses the electronic medical record system since 2006; for that reason, the pretest data will be gathered from October 1, 2009 to September 30, 2010. The decision to set the pretest time period was made to avoid any system pitfalls within the first year of implementing the electronic medical record and as the RRT service was initiated in October 2010. In order to control any possible confounding variables, such as the Holy Month of Ramadan, any seasonal variations or any other holidays, the same identical months will be selected for the posttest period. The posttest data will be derived from the electronic medical system from October 1, 2015 to September 30, 2016. However, the electronic record system will be

utilized to obtain the data representing the rates of patients' mortality, cardiopulmonary arrest, ICU readmission, and ICU length of stay.

Setting

This study will take place at the Royal Hospital in Muscat, the capital of Oman. The Royal Hospital serves as a tertiary hospital, which receives patients from all over the country. The main specialties at this hospital are general surgery, pediatric surgery, internal medicine, gynecology, and nephrology. It is considered to be the center for treatment of cancer and heart disease. Moreover, it has the greatest number of ICU/CCU beds in the country, which consists of 9 ICU and 7 CCU beds.

Subjects

The study population is patients admitted to the ICU/CCU and discharged from the department to the general wards. The convenience sample will include any patient of different races, genders, age, and health conditions. Any patients discharged from the ICU/CCU to home will be excluded from the study. According to the statistics, the Royal Hospital admitted 396 patients with a diagnosis of Acute Myocardial Infarction (AMI) during the year of 2015. The total death was 198 patients with the cause of circulatory system from a total of 724 deaths in the same year (Ministry of Health [MOH], 2016). Though, the patients who received RRT service could be estimated to be more than 200 patients per year.

Ethical Considerations

The proposal will be submitted to an Ethics Committee at the Ministry of Health, Oman for review and approval. The proposal will explain the purpose of the study, the data collection instrument, the potential benefits and risks, and the time frame in which the expected study will be completed. The confidentiality will be maintained to make sure patients' identities will not be identified. Moreover, the data will be stored in a secured place, and all electronic information will be protected by a password in a private computer which will be accessed by the researcher only.

Instrumentation and Data Collection

The researcher intended to use the historical controls to determine patients' mortality rate, cardiopulmonary arrest rate, ICU readmission rate, and ICU length of stay in the Royal Hospital, Oman. According to Viele et al. (2014), the historical controls can be used to gather information from the stored database. However, this method ensures to obtain accurate information, get better power, and minimize type I error. Ball, Kirkby, and Williams, (2003) used this data collection method to determine survival to discharge rate of the patients from the hospital; all the data were collected from patients' charts. Data will be gathered from the hospital electronic database; the database is known as Al-Shifa health system which is developed by the Ministry of Health. The electronic medical records provide a comprehensive data which is organized in a historical sequence (Fain, 2013). The data will be gathered by the researcher and recorded using Microsoft Excel spreadsheet as an instrument to collect the data (Table 2). The data will include gender, age, date of admission in ICU, date of discharge from ICU to

the general ward, readmitted in ICU, medical diagnosis, the length of stay in ICU, suffered from cardiac arrest, RRT initiated, and died in ICU.

The reliability of the data will be assessed by the use of the interrater reliability; this method used to compare the data collected. For the purpose of this study, the researcher and an RN colleague will independently record data on 10 patients during the pre-RRT period and 10 patients during the post-RRT period. The presented agreement will be calculated in order to measure the reliability (Grove, Burns, & Gray, 2013).

Data Analysis Plan

Data analysis will be conducted using IBM SPSS Statistics software for Windows, version 24. This study will assess the RRT as the independent variable, which is the intervention, and patients' outcomes as the dependent variables. The patients' outcomes include the patients' mortality rate, cardiopulmonary arrest rate, ICU readmission rate, and ICU length of stay. The data will include nominal and interval levels of variables in both control and intervention group. Nominal variables are gender (male/female), readmission in ICU (Yes/No), medical diagnosis categorized as (cardiovascular, respiratory, endocrine, neurological, musculoskeletal diseases), suffered from cardiac arrest (Yes/No), RRT initiated (Yes/No), and died in ICU (Yes/No). This data will be coded using codebook before entering into the statistical system (Table 3). The interval variables are age, date of admission in ICU, date of discharge from ICU to the general ward, and length of stay in ICU; all variables will be entered using the actual data. The data

will be described using the frequency and the central tendency with the utilization of the tables and bar charts.

The first inferential statistics will be utilized the t-test, this is the preferred test to compute and investigate the difference in the mean between two groups, in this study, testing for significant difference between the RRT and usual practice in term of ICU length of stay, the t-test will be used (Table 4). The test will use 95% as a confidence interval (Plichta & Garzon, 2009). The test will be used to examine the null hypothesis there is no difference in the length of stay in ICU in Oman Royal Hospital between the implementation of the RRT service compared to the usual practice. Besides, the research hypothesis which will be tested is there is a positive impact on the length of stay in ICU in Oman Royal Hospital for the patients received the RRT service compared to the patients received usual practice. The test is used to its best if the two groups are not related to each other, have equal variance, and have same dependent variables (Grove, Burns, & Gray, 2013). However, the test helps the researcher to conclude if the results have a significant difference between the groups' means (Plichta & Garzon, 2009).

The secondary inferential statistics will be utilized the Chi-Square test; this is the preferred test to compare the percentages of the nominal variables. The alpha level of $p < .05$ will be used to compute the statistical significance. (Grove, Burns, & Gray, 2013). To compare the difference in proportions of the patients' suffering of the cardiac arrest between the patients received the RRT service and to the patients received usual practice, the Chi-Square test will be used (Tables 5) (Grove, Burns, & Gray, 2013). The null hypothesis stated that there is no difference in the suffering of cardiac arrest in ICU in <https://assignbuster.com/effect-of-implementing-rapid-response-in-tertiary-hospital/>

Oman Royal Hospital between the implementation of the RRT service compared to the usual practice. Also, the research hypothesis which will be tested is there is a positive impact on the cardiac arrest surveillance in ICU in Oman Royal Hospital for the patients received the RRT service compared to the patients received usual practice.

To compare the frequency of RRT initiation during the year; the Chi-Square test will be used (Tables 6) (Grove, Burns, & Gray, 2013). The null hypothesis stated that there is no difference in the number of RRT service initiation in ICU in Oman Royal Hospital between the different months of the year. Also, the research hypothesis which will be tested is there is a difference in the number of RRT service initiation in ICU in Oman Royal Hospital between the different months of the year.

To compare the difference in proportions of the mortality rate among the patients received the RRT service and to the patients received usual practice, the Chi-Square test will be used (Tables 7) (Grove, Burns, & Gray, 2013). The null hypothesis stated that there is no difference in the mortality rate in ICU in Oman Royal Hospital between the implementation of the RRT service compared to the usual practice. Also, the research hypothesis which will be tested is there is a difference in the mortality rate in ICU in Oman Royal Hospital for the patients received the RRT service compared to the patients received usual practice.

Time Frame

The study is expected to be conducted in six months following receipt of the approval from the Ethics Committee at the Ministry of Health. The study will
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start with the interrater reliability procedure which is expected to be done in one week. Then the actual data collection process will be initiated which should be finished in the next 81 days. Subsequently, the analysis and interpretation should be ready within the next 60 days. Finally, the final report and the presentation of the findings will be ready for publication within the next 30 days.

Discussion

Implications and Conclusions

The study could be utilized to prove the effectiveness of the RRT service in Oman despite the different healthcare system and to recommend the areas for improvement in the existing service. Moreover, the most important point is to recommend the implementation of the service in all Oman Hospitals.

Limitations

The study will not touch the staff impression about the service and what they recommend based on their experience in this service. Moreover, the study will depend on the records as a source of the data rather than the conducting an experiment. However, the researcher has no previous experience in research which may act as a limitation for the study.

Suggestions for Future Research

It is recommended to conduct a true experimental study in order to come up with more valuable findings. Moreover, it is recommended to have a qualitative study which aims to explore staff experience and their feedback

about the service. Moreover, the study should explore staff's suggestions on how to improve the service.

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