



Analysis of Factors Helping and Hindering the Process of Handling and Implementing Code Blue

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ABSTRACT

Cardiopulmonary arrest adalah kondisi darurat yang membutuhkan perawatan dengan sangat cepat. Dalam dunia rumah sakit, ada tim khusus yang menangani kasus ini yaitu tim code blue. Dalam implementasinya, berbagai faktor dapat membantu dan menghambat penatalaksanaan pasien henti jantung. Penelitian ini akan melihat beberapa faktor yang dapat membantu dan menghambat, serta hal-hal yang cukup penting dalam implementasi blue code. Penelitian ini akan dilakukan dengan menggunakan pendekatan kualitatif. Data yang digunakan dalam penelitian ini adalah data sekunder yang berasal dari hasil penelitian dan penelitian sebelumnya yang masih memiliki relevansi dengan isi penelitian. Hasil penelitian ini kemudian menemukan bahwa faktor kelengkapan peralatan dan kesigapan perawat sangat penting dalam proses kegawatdaruratan seperti dalam penanganan code blue. Kemudian jumlah perawat yang kurang dan SOP yang tidak berjalan dengan baik dapat menghambat proses penanganan ini. Adapun untuk proses penanganannya, identifikasi pasien cukup penting, agar code blue bisa efektif dan meningkatkan kembalinya sirkulasi spontan (ROSC). Penerapan code blue sesuai protokol akan memberikan hasil yang efektif bagi pasien

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ABSTRAK

Cardiopulmonary arrest adalah kondisi darurat yang membutuhkan perawatan dengan sangat cepat. Dalam dunia rumah sakit, ada tim khusus yang menangani kasus ini yaitu tim code blue. Dalam implementasinya, berbagai faktor dapat membantu dan menghambat penatalaksanaan pasien henti jantung. Penelitian ini akan melihat beberapa faktor yang dapat membantu dan menghambat, serta hal-hal yang cukup penting dalam implementasi blue code. Penelitian ini akan dilakukan dengan menggunakan pendekatan kualitatif. Data yang digunakan dalam penelitian ini adalah data sekunder yang berasal dari hasil penelitian dan penelitian sebelumnya yang masih memiliki relevansi dengan isi penelitian. Hasil penelitian ini kemudian menemukan bahwa faktor kelengkapan peralatan dan kesigapan perawat sangat penting dalam proses kegawatdaruratan seperti dalam penanganan code blue. Kemudian jumlah perawat yang kurang dan SOP yang tidak berjalan dengan baik dapat menghambat proses penanganan ini. Adapun untuk proses penanganannya, identifikasi pasien cukup penting, agar code blue bisa efektif dan meningkatkan kembalinya sirkulasi spontan (ROSC). Penerapan code blue sesuai protokol akan memberikan hasil yang efektif bagi pasien

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INTRODUCTION

An emergency is a condition that can be life-threatening because there is a disturbance in the Airway, Breathing, and Circulation (ABC), if this condition is not helped immediately, it can result in death/disability. One of the emergency conditions is cardiac arrest / cardiac arrest. Cardiac arrest is a condition where the heart cannot function to pump blood suddenly, which has previously been diagnosed with heart disease or has not been diagnosed at all. According to the Indonesian Heart Association (IHA), cardiovascular disease is one of the causes of cardiac arrest. Loss of heart function to pump blood suddenly will cause circulatory collapse, loss of consciousness, and death if not treated immediately (Carachi & McCormack, 2020).

Cardiac arrest is categorized into two groups based on the location of occurrence: In-Hospital Cardiac Arrest (IHCA) means inside the hospital, and Out-Hospital Cardiac Arrest (OHCA) means outside the hospital. This difference has existed for a long time and is based on anticipated differences in patient characteristics, rescuer characteristics, and treatment time. Cases of cardiac arrest worldwide occur in hospitals between 0.5% to 2%. Research conducted in Australia and New Zealand revealed that the number of cases of cardiac arrest in hospitals ranged from 2-6 cases per 1,000 patients treated in hospitals. Studies in the United States show that hospital cardiac arrest reaches 200,000 cases yearly. Meanwhile, in Indonesia, there is no national cardiac arrest rate. The incidence of cardiac arrest is more reported based on hospital location. An example, example, is the incidence of cardiac arrest in a Padang hospital showing a significant increase in cases every year, in 2015, there were 20 cases, in 2016, it increased to 64 cases, and in 2017, it increased to 117 cases (Cikes et al., 2019).

There is a special system used in hospitals to treat cardiac arrest. The system application uses a code called a code blue. The code blue means that a patient in the hospital is having respiratory and cardiac arrest. The use of code blue also attempts to reduce mortality and raise the rate of Return of Spontaneous Circulation (ROSC) or return of spontaneous circulation. Delays in cardiac arrest treatment are related to the low life expectancy of cardiac arrest victims. For code blue to be effectively implemented, there must be an early introduction to cardiac arrest instances, including a knowledge component regarding code blue and basic life support (Gorodeski et al., 2020).

According to Mulya and Fahrizal, the blue code system consists of a team that has conducted special training for emergency conditions by providing a fast response. The code blue team is expected to be able to make efforts to save the lives of patients in this critical condition. The code blue team involves several professionals, namely doctors and nurses, appointed as a code team, where the team can perform Cardiopulmonary Resuscitation (CPR). As is known, patients with sudden cardiac arrest must be treated immediately, and the first thing to do is cardiopulmonary resuscitation (CPR), followed by using an Automatic External Defibrillator (AED) to analyze the heart rhythm automatically and give an electric shock so that heart rhythm returns (Thampi et al., 2020).

The blue code system is critical. This is directed at discussing the high rate of in-hospital cardiac arrest (IHCA). Risaliti stated that the high incidence of IHCA indicates an underlying disease and inefficient resuscitation. With this system, it is hoped that it will provide cardiac arrest assistance quickly and effectively to save patients (Toft et al., 2022).

The blue code system, in general, should be able to ensure quick and effective calls to resuscitate patients with cardiopulmonary arrest. This system was built as a quick response to cardiopulmonary emergencies in the hospital area so it can provide resuscitation and stabilization as soon as possible. This team must work quickly and efficiently to optimize help. On the other hand, emergency cardiopulmonary conditions often cause a high stressor on the team, which is pretty disruptive to implementation (Spitzer et al., 2019).

Therefore, this research will analyze various factors that can help and hinder handling code blue. This research will also then identify the process of implementing code blue.

Code Blue Concept

Code blue is the term used to call the code blue team in the emergency system for patients with cardiac arrest and respiratory failure. Code blue is a system of rapid response to help utilize resuscitation and stabilization in emergency conditions within the hospital area. When a person is found to be in cardiac or respiratory arrest, code blue must be invoked promptly. This system involves people who have been trained, tools, and medicines that are complete by following standard procedures. The code blue team comprises health workers such as doctors, nurses, and technicians who have been assigned the task (Monangi et al., 2018).

The blue code system is used to ensure that all emergencies in the hospital are treated as soon as possible. The two steps of this response mechanism are the initial reaction and the second response. The initial response (first responder) came from hospital staff around the scene. The hospital staff had to be trained in Basic Life Support (BLS) skills and played a role in activating the code blue to summon a second response team. The second responder (second responder) is a special and trained team from the department that the authorities have determined at the hospital. The success of life for patients with cardiac arrest at the hospital is not only supported by the effectiveness of the code blue system, but the availability of Basic Life Support (BLS) equipment placed at strategic locations in the hospital will enable a quick response to increasing the patient's survival rate (Nimmolrat et al., 2021).

According to Sitorus, there are three blue code criteria: airway, breathing, and circulation. There is a blockage in the airway. If there is airway obstruction, it is considered a disruption in breathing if the breath is abnormal (such as stopping or gasping) and a disturbance in circulation if no pulse can be felt within 10 seconds. Code blue is not activated for patients with Do Not Resuscitate (DNR) orders, terminal disease, or palliative care. Moreover, the types of rooms that are not triggered by code blue are operating rooms, intensive care units, emergency rooms, and cardiac catheterization rooms (Winoto, 2022).

The code blue process emphasizes the chain of survival in the hospital. This process includes the first is early recognition and prevention; the second chain is to activate the emergency response; the third chain is high-quality cardiopulmonary resuscitation (CPR); the fourth chain is to defibrillate immediately; the fifth chain is post-cardiac arrest care; the sixth chain is a recovery (Semeraro et al., 2021).

According to Chu, there are three phases of the code blue, namely as follows:

- a) Phase 1: The Activation period. This phase lasts five minutes till the arrival of the code blue team. The patient was discovered to be unresponsive, at which point the nurse quickly called for assistance (code blue

team) and began CPR. The other nurse responds by helping to bring the emergency trolley and defibrillator to the patient's side. The supporting nurse must next set the defibrillator to automated external mode, apply the pads, administer a shock on command, attach the backboard, and procure a bag valve mask to allow breathing (Chu, 2019).

- b) Phase 2: Disorganized period. Code blue team members individually/team arrive at the patient's scene. The team introduced themselves upon arrival to avoid confusion. The priority during this period is to continue a compression-ventilation ratio of 30:2 and provide intravenous or intraosseous therapy or access (if not already in place), and start counting or recording to document what is happening (Soar et al., 2021).
- c) Phase 3: Team formation period. Clear directions will help the team manage the roles and duties of the blue code team. When the code blue team members have gathered, the officer is at the patient's side. Each code blue member is responsible for their respective duties as a team leader, airway management, chest compressions, backup chest compressors, defibrillators/drugs, documentation/time, and circulars (Bingham et al., 2020).

From the understanding above, the researcher can conclude that code blue is a code system calling the code blue team to help save patients from cardiac and respiratory arrest emergencies. The code blue system involves trained people, supporting drugs, and complete equipment (Arjun Subramaniyan et al., 2018).

Nurse

The definition of a nurse, according to the International Council of Nursing (ICN), is someone who has completed nursing education that meets the requirements and has the authority in that country to provide nursing services who is responsible for improving health, disease prevention, and services for sick patients based on the knowledge that has been obtained through nursing education. The Indonesian Ministry of Health defines a nurse as someone who provides health services professionally. These services involve biological, psychological, social, and spiritual services aimed at individuals, families, and communities (Wheeler et al., 2022).

According to Budiono and Pertami, the role of the nurse can be described as follows:

- a) Care provider. The care provider is the most fundamental role of the nursing profession. Nurses help meet basic human needs through nursing services using the nursing process, from simple to complex (Mudd et al., 2020).
- b) Advocate. The nurse's role as an advocate is to assist clients in making decisions in approving nursing actions given to patients and maintaining and protecting patient rights (Abbasinia et al., 2020).
- c) Educator. The nurse's role as an educator is to assist clients in increasing their level of health knowledge, including symptoms of disease and the actions taken so that behavior changes occur in the client (Luther et al., 2019).
- d) Coordinator. The nurse acts as a coordinator by directing, planning, and organizing health services with the health team so that the provision of health services is handled according to the client's needs (Fealy et al., 2019).
- e) Collaborator. Nurses collaborate with other health workers such as doctors, physiotherapists, nutritionists, pharmacists, and others. The form of collaboration that is

carried out is in the form of identifying nursing services and determining the further needs required by the client (Okoh et al., 2020).

- f) Consultant. The nurse is a place to consult on problems or appropriate nursing actions for clients.
- g) Researcher. Nurses carry out planning, collaboration, and systematic and directed changes according to the method of providing nursing services. Nurses are the most dominant health workers in providing health services, and this causes nurses to have an essential role in the inpatient room. There are various types of diseases in the inpatient room with different conditions. Nurses with patients 24 hours a day treat various diseases and conditions, even if the conditions are bad. In deteriorating conditions, it must be treated immediately before experiencing a widespread decline in clinical conditions so that unwanted events do not occur, including cardiac arrest. So the inpatient room is often called code blue (Paguio et al., 2020).

METHODS

This research will be carried out using a qualitative approach. The selection of this method was carried out to see better the phenomenon being studied. The data used in this study is secondary data derived from previous studies and studies that still have a relationship with the content of this research. The research data the author has managed to collect will be processed by the author immediately so that later the results of this research can be found.

RESULTS AND DISCUSSION

Many factors can influence Code Blue's implementation. These factors can affect how well code blue is implemented in a hospital.

Auxiliary Factors in the Implementation of Code Blue

Several factors can help the success rate of implementing code blue in a hospital. These factors include the availability of complete equipment and good cooperation between nurses. Availability of emergency trolleys containing tools and equipment to perform cardiopulmonary resuscitation and to handle other emergencies, for example. This emergency trolley is used in the inpatient installation area and may only be used in case of an emergency.

Emergency trolleys that are available and complete, including the medicines in them, will be very helpful when handling patients. Emergency drugs such as epinephrine, dobutamine, dopamine, and others are available in the trolley. After each use, the trolley will be refilled immediately, and the drugs used will be replaced immediately so they can be used again in an emergency.

Then another supporting factor is cooperation between nurses who are well-established. With this excellent cooperation, when a team of nurses feels overwhelmed in serving patients, other teams who are not busy will help, and vice versa. This good cooperation between nurses is very helpful in carrying out their work as nurses. Especially in an emergency, the help of other nurses will significantly help the success rate of code blue conditions.

A nurse is a job that requires special expertise and skills to meet the needs of patients, including the biological, psychological, sociological, and spiritual needs of patients. This can be realized by helping, entertaining, sharing, and collaborating with other nurses so that a comprehensive service is realized.

In several hospitals, there is the use of TBaK Sbar in carrying out collaboration between nurses. TBaK itself stands for write back, read back, and confirm again. Participants explained the implementation of TBaK, namely, when hearing instructions from a doctor via telephone, the nurse must reconfirm all instructions given. It is better to confirm that other people or nurses also listen and become witnesses. This is done because TBaK stands for write back, read back, and confirm again. Participants explained the implementation of TBaK, namely, when hearing instructions from a doctor via telephone, the nurse must reconfirm all instructions given. We recommend that when confirming, there are other people or other nurses who also listen and become witnesses.

Then SBAR is also an abbreviation of Situation, Background, Assessment, and Recommendation. This term is used when calling the doctor, where the nurse explains all the patient's conditions, where the nurse explains the patient's condition (situation), the patient's medical history (background), actions that have been and are being taken (assessment), then ask for advice or recommendations from the doctor (suggestion) taking into account the TBaK as mentioned earlier. The SBAR communication technique model can help nurses organize ways of thinking, organize information, and feel more confident communicating with doctors.

Inhibiting Factors in the Implementation of Code Blue

Several factors can hinder the code blue handling process in a hospital. Some of these factors include the lack of nurses, the absence of SOPs handling emergency conditions, and the code blue team not working correctly.

Fewer nurses will make it difficult for nurses to treat patients. This will often result in many nurses needing to handle an excess number of patients, which is not part of their responsibility. This, in turn, can cause nurses to feel exhausted and complicate the process of handling patients who are in an emergency condition.

Then the absence of SOP in handling emergency cases makes it difficult to handle patients at the emergency level. This can cause nurses to rely only on their experience and knowledge. SOPs will help nurses treat patients based on existing SOPs to facilitate the necessary actions.

Furthermore, the existence of a code blue team that is not running well can also hinder handling patients in emergency cases. A code blue team that doesn't run well can be caused by various things, such as the formation of a code blue team that didn't have time to be implemented, or the rare emergency, so that the existing code blue team rarely carries out activities.

The Importance of Patient Identification in the Implementation of Code Blue Handling

According to the hospital code blue team standards, in order to maximize the performance of the code blue team, at least this response system is separated into two phases. The initial response is carried out by hospital staff, both medical and non-medical, who are in close proximity to the victim (first responders). The blue code team delivered the second

response (second responder). These first responders should be skilled in administering basic life support and should be drawn from the immediate area of the occurrence. Similarly, the second responder is a member of a selected and qualified team appointed by the hospital's governing authority.

The challenge of patient identification emerged as a significant finding from the literature research. In the study conducted by Hisham et al., it was determined that the patients in the code blue group were not all in a condition of cardiopulmonary arrest or pulmonary or cardiac arrest. However, some common illnesses are not examples of cardiopulmonary arrest. In a research conducted by Hisham et al. (2015), only 78.07% of participants exhibited genuine cardiac arrest. This became the leading concern for a number of nurses and the primary cause for activating the blue code system. This results in not thoroughly checking the patient's condition before initiating the code blue call. When an officer discovers a patient who is fainting, about to pass out, or limp, he or she panics and immediately activates the blue code system. As a result, the patients under the blue code system were not intended to be in cardiac arrest.

Effective Code Blue Implementation Can Improve ROSC

The majority of research indicate that the code blue team is successful enough to avert death when patients exhibit signs of spontaneous circulation. Thomas & Shafi (2017), in the study "Survival After In-Hospital Cardiac Arrest and Code Blue Initiation," found 130 patients could be saved, or patients' circulation returned to normal (ROSC) from 442 code blue calls. While Farooqi et al. (2017) get 62.5% of activated code blue calls, resuscitation can be carried out successfully. 56.25% of patients were helped by tracheostomy, and 25% were successfully intubated.

According to Risaliti, a high IHCA implies the presence of an underlying illness and ineffective resuscitation. Code blue, it is thought, would aid in the effective treatment of hospital patients experiencing cardiopulmonary arrest. The article focuses on the blue code team's response and does not describe the underlying condition. With a large number of ROSC numbers or by examining code blue patients who can go home or leave the hospital, it is possible to determine the number of rescued individuals, which is not tiny. Consequently, some of these research found that code blue is effective for boosting ROSC rates.

Implementation According to the Protocol will Give Better Results

Providing correct resuscitation and as soon as possible is the key to the effectiveness of cardiopulmonary arrest assistance. Jackson and Grugan said the key to the effectiveness of code blue is the quality of resuscitation and timeliness. In principle, the process of providing essential life support assistance in the blue code system refers to the chain of survival following the 2015 AHA guidelines. Namely includes: first is to immediately detect the victim's condition and ask for help (early access); the second chain is immediate cardiopulmonary resuscitation (CPR); the third chain is early defibrillation; the fourth chain is early advanced cardiovascular life support measures; and the fifth chain is post-cardiac arrest care.

The implementation of a code blue that has not complied with the protocol was also found in this literature study. It is not explained in detail which protocols are challenging to implement. Is it related to the security of the patient's location, patient recognition, immediate activation of the

emergency team, or implementation of a resuscitation process that is not following the procedure. Jayasingh et al. (2018) found that 41.33% of the code blue implementation was inconsistent with the protocol. Implementing code blue assistance following the AHA protocol will provide better results. The results of code blue assistance are the number of patients successfully appropriately treated, namely the ROSC incidence indicator. This was concluded in a study by Jayasingh et al., which uses algorithm 88 and does not use algorithm 62. ROSC on using algorithm 59 and on without algorithm.

CONCLUSIONS AND SUGGESTIONS

Based on the results of the discussion above, several factors were found that can help and also hinder the process of handling patients in an emergency. These factors certainly have differences with each hospital condition. In addition to these factors, it was also found that there was an inappropriate identification of patients who needed an emergency, where the patient was not part of the cardiopulmonary arrest case. With an effective code blue team, more and more patients can survive so that the patient's circulation can return to normal (ROSC). As for the treatment of patients who need a code blue team, it can give good results with the appropriate protocol. The quality of resuscitation and timeliness can increase the success of treating patients with cardiopulmonary arrest.

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