

Implementation of Team Management Emergency and Code Blue Activation in Regional General Hospitals: Case Study

Novia Fazatiwahida^{1*}, Julfilkar Adnan Irnu², Rafi Achmad Rukhama³, Viky Noviani Hemu³, Suprayogi³, Bagus Alfrisa³, Purnomo Wahyudi³, Hari Setyobudi³, Setyo Triatmojo³, Sri Setiyarini³, Happy Indah Kusuma³

¹Universitas Jember, Jember, Indonesia

²Politeknik Karya Husada Jakarta, Jakarta, Indonesia

³Universitas Horizon Indonesia, Karawang, Indonesia

³Politeknik Negeri Subang, Subang, Indonesia

³Institut Kesehatan Medistra Lubuk Pakam, Deli Sedang, Indonesia

³Universitas Gadjah Mada, Yogyakarta, Indonesia

*Email Korespondensi: noviafaizatiwahida@unej.ac.id

Kata Kunci:	Rumah sakit umum daerah sebagai lini pertama layanan kesehatan masih menghadapi tantangan
Rumah Sakit	tingginya angka mortalitas dan morbiditas pasien. Upaya menurunkan angka tersebut dapat dilakukan
Daerah, Manajemen	melalui penerapan sistem Team Medical Emergency (TME) dan code blue sebagai mekanisme deteksi
Tim Darurat, Kode	dini serta respons cepat terhadap kondisi gawat darurat. Penelitian ini bertujuan untuk mengetahui
Biru	implementasi TME dan code blue di Rumah Sakit Umum Daerah dr. Soedirman Kebumen. Metode
Keywords:	penelitian menggunakan desain case study dengan data sekunder yang dikumpulkan pada periode Mei
<i>Regional hospital,</i>	2022 hingga Februari 2023. Data dianalisis untuk melihat distribusi aktivasi TME dan code blue
<i>Team</i>	berdasarkan jenis kasus, jenis kelamin, serta unit pelayanan. Hasil penelitian menunjukkan bahwa
<i>management</i>	aktivasi TME dan code blue paling banyak terjadi pada pasien dengan kasus penyakit dalam, berjenis
<i>emergency, code</i>	kelamin laki-laki, serta di ruang rawat inap dewasa. Temuan ini mengindikasikan bahwa implementasi
<i>blue</i>	sistem TME dan code blue sangat dipengaruhi oleh faktor jenis kasus, karakteristik pasien, dan lokasi
Info article	perawatan. Implikasi dari penelitian ini adalah perlunya optimalisasi pelatihan tenaga kesehatan,
Date posted:	penguatan sistem deteksi dini, serta evaluasi berkelanjutan terhadap implementasi TME dan code blue
04 Agustus 2025	untuk menurunkan angka mortalitas dan morbiditas di rumah sakit umum daerah.
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24 Agustus 2025	<i>Hospitals: Case Study</i>
Date received:	Regional general hospitals, as the first line of healthcare services, still face the challenge of high patient
01 September 2025	mortality and morbidity rates. Efforts to reduce these rates can be achieved through the implementation
DOI Article:	of the Team Medical Emergency (TME) and Code Blue systems as early detection mechanisms and
Page: 415-422	rapid response to emergency situations. This study aims to determine the implementation of TME and
	Code Blue at Dr. Soedirman Regional General Hospital, Kebumen. The research method used a case
	study design with secondary data collected from May 2022 to February 2023. Data were analyzed to
	determine the distribution of TME and Code Blue activations based on case type, gender, and service
	unit. The results showed that TME and Code Blue activations were most common in patients with
	internal medicine cases, male patients, and in adult inpatient wards. These findings indicate that
	the implementation of the TME and Code Blue systems is significantly influenced by factors such as case
	type, patient characteristics, and treatment location. The general implications of this study are the need
	to optimize healthcare worker training, strengthen early detection systems, and continuously evaluate
	TME and Code Blue implementation to reduce mortality and morbidity in regional hospitals.

Introduction

Cardiac arrest is one of the emergency conditions that requires quick and appropriate treatment by trained medical personnel in order to increase the patient's chances of survival (Dame et al., 2018). The prevalence of cardiac arrest in Indonesia according to the Indonesian Association of Cardiologists (PERKI) reaches 10 cases per 100,000 normal people under the age of 35, with an estimated 300,000–350,000 incidents every year. This high number shows the urgency of an effective emergency response system in health care facilities.

Medical Record Data at dr. Soedirman Hospital Kebumen in 2022 shows a Gross Death Rate (GDR) of 48% and a Net Death Rate (NDR) of 33% (Medical Records of dr. Soedirman Hospital, 2022). This figure is still above the standard of the Ministry of Health, namely $GDR \leq 45\%$ and $NDR \leq 25\%$ (Permenkes, 2010). This condition shows that there is a gap between the service quality standards set and the hospital's achievements, so a more optimal handling strategy is needed.

A number of previous studies have shown that the application of code blue and rapid response systems can reduce the rate of sudden cardiac arrest and increase the success of resuscitation (Monangi et al., 2018; Eroglu et al., 2014). In addition, the implementation of Team Medical Emergency (TME) has been shown to play an important role in the early detection of critical conditions of patients and prevent cardiac arrest in the treatment room (Herod et al., 2014; Morrison et al., 2013). However, research related to the implementation of the TME and code blue systems in regional hospitals, especially in Indonesia, is still very limited. This shows that there is a gap of knowledge that needs to be answered.

RSUD as the first line of health services has a great responsibility in reducing mortality and morbidity rates. Therefore, the existence of the TME and code blue systems is crucial to ensure the readiness of hospitals in handling cases of cardiac arrest and other emergency conditions. Since 2019, dr. Soedirman Kebumen Hospital has formed a Resuscitation System Committee with a team consisting of a guard doctor as a leader, an ICU nurse as a resuscitation officer, and an emergency room nurse as a compression officer (dr. Soedirman Hospital, 2019).

Although previous studies have shown the effectiveness of the code blue and TME systems in reducing mortality rates, similar studies in regional hospitals in Indonesia are still very limited. This condition shows that there is a knowledge gap related to the implementation

of the emergency response system at the hospital primary service level. This research has a novelty by evaluating the implementation of TME and code blue at dr. Soedirman Kebumen Hospital in the period May 2022 – February 2023. The results of the research are expected to contribute to improving service quality, reducing mortality rates, and becoming a reference for the development of emergency response systems in other regional hospitals.

Method

This type of research is a descriptive research with a case study design that aims to evaluate the implementation of Team Medical Emergency (TME) and code blue at dr. Soedirman Kebumen Hospital. The study was carried out on March 15-16, 2023 using medical record data for the period May 2022 to February 2023. The study population was all inpatients at dr. Soedirman Kebumen Hospital in that period, with a total of 136 medical record data. The determination of the sample was carried out by total sampling, which is taking all data that met the research criteria. The inclusion criteria were patients with cases of internal disease, cardiology, pulmonary, surgical, and neural. Meanwhile, the exclusion criteria are patients who do not experience TME or code blue activation. The research instrument was in the form of an observation/checklist sheet developed based on the TME activation data format and code blue used by the hospital resuscitation team. This instrument has gone through a content validity test by emergency medical experts and verified its conformity with hospital resuscitation system standards. The reliability of the instrument is maintained through uniformity of recording and verification of data by two independent recording officers. The data collection technique was carried out by extracting secondary data from the resuscitation team and medical record unit related to TME activation and code blue. The data were analyzed descriptively by presenting frequency and percentage distributions based on the variables of case type, gender, and patient care unit. The results of the analysis were then compared with the findings of previous research as well as the reference standards for the implementation of TME and code blue to obtain a more comprehensive picture.

Research Results

During May 2022 - February 2023, there were 136 TME and *code blue* activation data with the following details.

Table 1 TME and Code Blue Activation Frequency Distribution (n=136)

Activation Type	Frequency (%)
TME	31(22.80%)
Code Blue	105 (77.20%)
Total	136 (100%)

Based on Table 1, it can be seen that the most type of activation is *code blue* (77.20%).

The data on the activation results can be seen in the table below.

Table 2 ROSC dan Non-Rosc, DNR

Item	Activation		Activation Results			
	TME	Code Blue	Non-ROSC	DNR	ROSC	PLACE
Gender						
Man	20	62	45	6	24	7
Woman	11	43	23	7	22	2
Total	31	105	68	13	46	9

Based on table 2, it is known that the most activation results are Non-ROSC as many as 68 (50%) occurrences, namely 45 (66.18%) in men and 23 (33.82%) in women.

Of the 136 activations above, if you look at the gender, you can see the table below.

Table 3 Gender Frequency and TME Activation Results and code blue by Gender (n=136)

Gender	Activation		
	Code Blue f (%)	TME f (%)	Total f (%)
Man	62 (59,05)	20 (64,52)	82 (60,29)
Woman	43 (40,95)	11 (35,48)	54 (39,71)
Total	105	31	136

Based on Table 3, it is known that the most activation is *code blue* in patients with male sex (59.05%) and TME in patients with male sex (64.52%).

Activation based on case type can be seen in the table below.

Table 4 Activations and Case Types in May 2022-February 2023(n=136)

Case Type	Activation		
	Code Blue	TME	Total
In the	58	9	67
Jantung	14	8	22
Published	8	12	20
Surgery	14	2	16

Saraf	11	-	11
Total	105	31	136

Based on Table 4, it is known that the comparison between the frequency of TME and *code blue* activation with the type of case is known. The *most activation of code blue* in cases of internal medicine was 58 (55.2%) and the most activation of TME in the type of pulmonary case was 12 (38.7%).

From all the activations above, the activation by room can be seen in detail in the following table.

Table 5 Activations and Rooms in May 2022-February 2023 (n=136)

Ruangan	Activation		
	Code Blue	TME	Total
Internal medicine room	53	7	60
Internal medicine, surgery, pediatrics	25	3	28
Infectious and pulmonary disease space	10	14	24
Internal medicine and nerve chambers	7	5	12
Operating room	6	2	8
HD Space	2	-	2
Internal medicine and surgical rooms	2	-	2
Total	105	31	136

Based on Table 5, it is known that the comparison between the frequency of TME and *code blue* activation is known with the room. The *most code blue* activation in cempaka was 53 (50.5%) and the most TME activation in the ylangana room was 14 (45.2%).

Discussion

This study shows that the implementation of Team Medical Emergency (TME) and code blue at dr. Soedirman Kebumen Hospital still faces a number of challenges. Code blue activation was recorded higher (77.2%) compared to TME (22.8%). This condition indicates that the early detection function through TME has not been running optimally. Ideally, TME activation is done more because the system is designed to anticipate the worsening of the patient's condition before cardiac arrest occurs. This imbalance can reflect the lack of understanding of health workers on early warning signs, limited patient monitoring systems, or suboptimal communication between professions. These findings are in line with Monangi et al. (2018) and Eroglu et al. (2014) who stated that weak early response systems contribute to the increased incidence of in-hospital cardiac arrest.

The activation results showed that the number of non-ROSC was higher (68 cases) than ROSC. The high number of non-ROSC can be caused by various factors, such as severe clinical conditions of patients, delayed activation, and limited resuscitation facilities. Spitzer et al. (2019) assert that delays in detecting abnormal vital signs have a direct impact on the low success of resuscitation. This means that even though the code blue response at the hospital is quite fast (<5 minutes), the quality of activation and clinical readiness of patients remains a determining factor for success. Therefore, prevention efforts through TME optimization, monitoring of high-risk patients, and routine evaluation of resuscitation outcomes are crucial.

When viewed from the characteristics of patients, activation occurs more in men. These findings are in line with research by Dewangga et al. (2022) and Cristy (2021) who found that men are more prone to cardiac arrest due to biological, hormonal, and lifestyle habits such as smoking, alcohol consumption, and less physical activity. Wahyuni (2014) also mentioned that the hormone estrogen provides cardiovascular protection in women before menopause, so the risk is higher in men. Thus, the findings of this study confirm that the gender factor is still an important determinant in the incidence of cardiac arrest in hospitals.

Judging from the type of case, the majority of code blue activation occurs in internal medicine patients, especially with high comorbidities. Internal medicine patients generally have multiple chronic conditions such as chronic kidney failure (CKD), metabolic disorders, or respiratory diseases that have the potential to rapidly worsen clinical status. This is in line with Dewangga's (2022) research which states that most causes of in-hospital cardiac arrest do not come from cardiac causes alone, but from other complex medical conditions. Thus, strengthening monitoring and resuscitation capacity in internal medicine patients must be a priority for hospital interventions.

In terms of service units, the most activation was found in the internal medicine and cardiac rooms. This is consistent with the research of Oyoh et al. (2017) which showed that the number of cardiac arrests is closely related to the complexity of cases and the workload of health workers in the care unit. Internal medicine rooms often house patients with high comorbidities, while cardiac units treat patients at risk of sudden cardiac arrest. This condition emphasizes the importance of adequate distribution of resources, both in terms of health workers, the

availability of resuscitation equipment, and compliance with standard operating procedures (SPO).

The implications of this finding are quite broad. First, hospitals need to strengthen the function of TME as an early detection system, not just a response after cardiac arrest occurs. This can be done through increasing the training of health workers, optimizing the use of monitoring tools, and implementing an early warning system based on clinical scores. Second, high non-ROSC outcomes indicate the need to evaluate the quality of resuscitation, including team skills, adequacy of facilities, and speed of access to emergency medicine. Third, patient factors (gender, chronic disease, comorbidities) must be considered in the preparation of cardiac arrest prevention protocols in hospitals.

Overall, this study confirms that the implementation of TME and code blue at dr. Soedirman Kebumen Hospital has been running, but it has not been fully effective in reducing the rate of cardiac arrest and increasing resuscitation output. Therefore, systemic evaluation, strengthening interprofessional coordination, and more proactive preventive strategies are needed to reduce mortality rates in regional hospitals.

Conclusion

The implementation of TME and code blue in Regional General Hospitals can be known based on the number of activations according to gender, room and type of case. The most activations are code blue activations with Non-ROSC activation results. Code blue activation is most common in males in cases of internal disease, internal medicine, pulmonary, cardiac and infectious diseases.

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