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Assessment of Disaster Management Through LOS and PAPS Rate Analysis of RSSA ED in Mass Casualty Incident of Kanjuruhan Tragedy

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Abstract:
Background: Emergency department (ED) is an essential aspect of modern health services in a hospital where it is crucial to maintain the integrity of the health care system during crisis. This study intends to evaluate emergency management of RSSA ED through analysis of patient length of stay (LOS) and discharge against medical advice (PAPS) rates of RSSA-ED in mass casualty incidents (MCI). **Methodology**: This is an analytic observational cross-sectional study to assess the number of patients, LOS and PAPS of patients in the RSSA-ED before and during the Kanjuruhan MCI tragedy. Data analysis was carry out with the Wilcoxon test. **Results**: The number of RSSA-ED patients on 7 days before MCI was 440 patients (45.98%) and within 7 days of the response phase were 517 patients (54.02%). Wilcoxon test was performed and obtained P=0.021 ($p< 0.05$). Average of ED LOS was 4.61 hours and 4.47 hours respectively. With the same test, P = 0.074 ($p> 0.05$). PAPS rate was 12 cases and 14 cases respectively with P = 0.059 ($p> 0.05$) which means that there was no significant difference between the ED LOS and the PAPS rates before and during the response phase of MCI. **Conclusion**: The significant increase in the number of patients during Kanjuruhan tragedy but not followed by prolonged LOS and PAPS rate for all patients in the RSSA-ED shows the disaster management carried out was quite good. In spite of this incident, RSSA-ED can still maintain the quality of service (waiting time and overall patient satisfaction).
Keywords: Emergency Department, Mass Casualty Incident, Kanjuruhan Tragedy, Response Phase.

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Introduction

The emergency department (ED) is an essential aspect of modern health services in a hospital. In providing emergency services to patients, the ED must also be prepared to provide services for mass casualty who come when a disaster occurs. Overcrowding conditions caused by the crisis can lead to obstacles in servicing all ED patients so that the quality of essential services and supporting services for all ED patients can be used as an indicator of success in handling crisis conditions (incidents or disasters) (Gregory R. Ciottone, MD, 2015; Strauss & Mayer, 2014).

Emergency management activities must be directed by a multidisciplinary team which is the center of all activities and led by the head of the ED, namely an emergency specialist who will report directly to the

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administrative and medical heads of the hospital. This planning effort should focus on all phases of disaster, mitigation, preparedness, response and recovery. Hospital emergency preparedness is very important to maintain the integrity of the health care system during disasters and mass casualty incidents, especially in ED (Gregory R. Ciottone, MD, 2015; World Health Organization, 2007).

A mass casualty incident (MCI) is an event that involves a number of victims that exceed the ability of local emergency medical services (EMS) to respond in a normal manner. Eventhough the events that occur are not as bad as what we call disasters, these events can cause paralysis in the health care system in the ED if not handled properly (Organization & All, 2019; World Health Organization, 2007)

One of the MCI that occurred in Indonesia, especially in Malang Regency on October 1st, 2022 was the Kanjuruhan tragedy which claimed 754 victims and 131 people died. Where most of the victims who needed treatment were taken to Rumah Sakit dr. Saiful Anwar (RSSA) as a referral hospital in the East Java region

This study intends to evaluate the emergency management of the RSSA ED through an analysis of the quality of core services represented by length of stay (LOS) and discharge against medical advice (PAPS) rate of patients in the RSSA ED before and during the response phase of the Kanjuruhan MCI.

Materials and Methods

The study design was an analytic observational with cross-sectional study to examine patient LOS and PAPS rates for all patients in the ED before and during the response phase to the Kanjuruhan MCI.

Sampling was carried out using consecutive sampling by matching and the data was taken based on the patient's LOS in the RSSA ED for 7 days before the MCI and during the emergency response period for the mass casualty incident for 7 days, from September 24th, 2022 to October 07th, 2022 with inclusion criteria of the samples were all patients who registered and received treatment at the RSSA ED while the exclusion criteria were patients with incomplete LOS data at the ED, newborn who registered through the RSSA ED and patients who death on arrival and were not resuscitated. Sampling framework shown in figure 1.

The independent and dependent variables in this study were the LOS and the PAPS rate of patients in the RSSA ED before and during the emergency response period for MCI. The researcher also analyzed the variable number of patients before and during the emergency response period of the Kanjuruhan MCI as the indicator to show that this case was an incident at RSSA (different hospital could give different definition according to their capability).

Analysis of the two data will be carried out using a paired t test if the data is normally distributed, whereas if the data is not normally distributed, the Wilcoxon test will be used in carrying out the analysis using SPSS software.

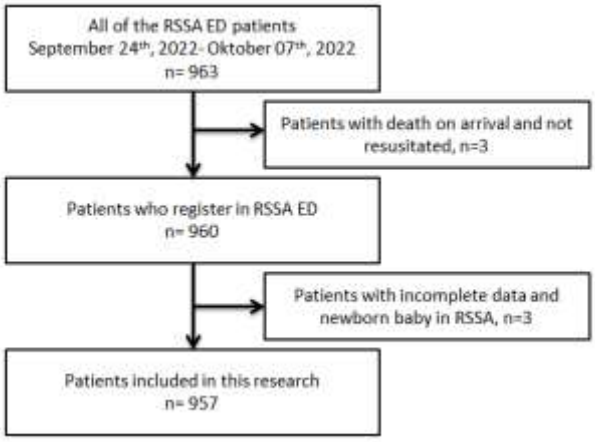

Figure 1. sampling framework

Result and Discussion

From the data collection, 957 patients were included in this study with the following distribution: 392 male patients (40.96%) and 565 female patients (59.04%)

The number of patients 7 days before MCI who received treatment at the RSSA ED were 440 patients (45.98%) and the number of patients within 7 days of the response phase were 517 patients (54.02%). A statistical test was carried out on this variable using the Wilcoxon test because the numerical data were not normally distributed and P=0.021 (P<0.05) was obtained, which meant that there was a significant difference between the number of ED visits in the pre-MCI phase and the number of emergency room visits in the response phase of MCI.

Based on the triage level, the most patients were categorized in priority 2 (P2), whose condition is urgent and require immediate treatment; 630 patients (65.83%) followed by priority 1 (P1), whose condition is critical and requires immediate resuscitation; 194 patients (20.27%) and priority 3 (P3), whose condition is urgent but the treatment time can still be extended; 133 patients (13.9%)

The average of ED LOS in the 7 day phase before MCI was 4.61 hours and the ED LOS in the 7 day response phase was 4.47 hours. A statistical test was

carried out on this variable using the Wilcoxon test and P=0.074 (P>0.05) was obtained. The number of PAPS patients in the 7 day phase before MCI was 12 cases and PAPS patients in the 7 day response phase were 14 cases. A statistical test was carried out on this variable using the Wilcoxon test and P = 0.059 (P> 0.05) (table 1).

Table 1. Result of the research

Variable	Result	Significance
Sex		
Male	392 (40,96%)	-
Female	565 (59,04%)	
Number of patients		
Pre MCI phase	440 (45,98%)	P=0,021 (<0,05)
MCI Phase	517 (54,02%)	
Triage level		
Priority 1	194 (20,27%)	-
Priority 2	630 (65,83%)	
Priority 3	133 (13.9%)	
ED LOS		
Pre MCI phase	4,61 Hours	P=0,074 (>0,05)
MCI Phase	4,47 Hours	
ED PAPS		
Pre MCI phase	12 Cases	P=0.059 (>0.05)
MCI Phase	14 Cases	

From the results of the study it appears that in the MCI phase the number of patients has increased compared to pre-MCI with the peak of the increase in patients occurring at the night and early in the morning after the incident (the incident took place at the middle of the night). It was concerned that an increase in the number of patients in a short time could lead to overcrowding in the ED, resulting in a number of patients being left untreated and resulting in disruption of core services in the ED, resulting in prolonged LOS and an increase in the number of PAPS in the ED due to overcrowding. From the statistical tests performed, it appears that there was a significant difference between patient visits before and during the MCI Kanjuruhan phase, which means that there was a significant increase in the number of patients; 440 cases before and 517 cases during MCI with a total of 794 MCI victims and 96 cases taken to RSSA ED, Malang. Meanwhile for the ED LOS the results showed that there was no significant difference between the LOS before and during the MCI phase. It can be concluded that even though there was a significant increase in the number of patients (P = 0.021), the RSSA ED could handle it quite well, as evidenced by the LOS of the emergency room which did not experience significant changes (P = 0.074) as well as the PAPS rate also gave the same results where there was no significant difference between the PAPS rate in the pre-MCI phase and the PAPS rate in the MCI response phase (Mowery et al., 2011; Singh et al., 2017; The European Commission, 2013)

In dealing with victims of the MCI, the hospital got a warning in a very short time and the sudden warning can be an indicator for increasing the risk of paralysis in the ED services. With the presence of an emergency specialist as the head of the ED along with multidisciplinary team with good cooperation, the MCI can be overcome quite well. The initial step taken by the team was to appoint the head of the ED as the person in charge at the ED level. With the person in charge, the directions given will be clear according to the command line. Then the head of the ED creates a system by directing existing reserve resources where reserve capacity must consist of 4 aspects namely staff, supply, space and system. One of the important step is creating a triage system with detailed reporting, especially for patients who are the victims of the Kanjuruhan tragedy. Regarding the space, some of the P2 maintenance cabins were converted into P1 maintenance cabins by maximizing the use of portable monitors. Reports on assigned patients are updated regularly in each shift. After going through the full activation phase, on the 3rd day the ED began to enter the de-escalation phase where the patient victims of the Kanjuruhan tragedy who came to receive treatment gradually decreasing and the ED services also gradually returning to the way they were before. On the 7th day the ED service has entered the recovery phase where the service is the same as before the incident occurred and in this phase it is time to evaluate what has been done as a valuable lessons that can be applied to subsequent incidents (Singh et al., 2017 ; The European Commission, 2013; World Health Organization, 2007)

The most difficult problem to face is the large number of journalists and very important people who came to find information about patients. Even though it has been explained that the information will be provided through the spokesperson and will be

updated regularly, this remains a problem and quite disruptive to services at the ED with the large number of visitors arriving and very difficult to limit. To overcome this, it is recommended to establish an information post with periodic updates that are broadcast directly from the post to the journalists and official disaster management agencies so that it does not disturb the staff and the ED area used for patient care (The European Commission, 2013; World Health Organization, 2007).

Collaboration from the Doctor in Charge of the Patient (DPJP) from other departments, especially the Surgery, Anesthesia, Internal Medicine, Lung and Eye departments as well as support from Radiology and Clinical Pathology with the emergency department as the first activated team in resuscitation and disposition decision making in the ED which has been discussed in the coordination meeting in the emergency response phase is also very helpful in treating MCI patients. because the multidisciplinary team is the center of all patient service activities. Besides that, planning phase in dealing with disasters is also very crucial so that during the emergency response phase, all personnel already know "what and how to do" because the worst thing in facing a disaster is to be part of the disaster itself (Negasi et al. , 2022; Otto et al., 2022; World Health Organization, 2007)

Conclusion

From the results of the study it can be concluded that there was a significant increase in the number of patients of the MCI but not followed by a prolonged LOS nor an increase of PAPS rate in the RSSA ED in the same period shows that the quality of service is still maintained.

In addition to providing emergency services to the patients, the ED must also be prepared to plan the delivery of services for mass victims who come when a disaster occurs. This planning effort should focus on all phases of disaster, mitigation, preparedness, response and recovery where hospital emergency preparedness is very important to maintain the integrity of the health care system during disasters and MCI especially in the ED.

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