



## The relationship between the selection of the triage category with the delay system of stemi patients in the adam malik hospital Medan

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### ABSTRACT

Latar belakang: Proses yang terjadi di IGD merupakan proses yang krusial bagi penanganan STEMI. Pada waktu ini merupakan saat ditegakkan nya diagnosa pada pasien dan diputuskan untuk dilakukan tindakan selanjutnya. Keterlambatan atau *delay* akan sangat merugikan pasien jika terjadi terutama jika terjadi saat pasien STEMI berada di IGD. Salah satu hal yang kemungkinan menyebabkan system delay di IGD adalah pemilihan kategori triase untuk pasien STEMI. Triase yang dipilih untuk pasien akan menentukan waktu tunggu pasien dan urgensi pasien tersebut untuk ditangani yang memungkinkan pasien akan lebih lama menunggu jika diletakkan pada kategori 2 atau kategori 3. Metode: Penelitian ini merupakan penelitian kuantitatif dengan menggunakan rancangan observasional analitik dengan jenis *cross sectional*. Dalam penelitian ini dilakukan pengamatan terhadap pengaruh pemilihan kategori triase dengan *system delay* Pasien STEMI di ruangan IGD. Populasi pada penelitian ini merupakan seluruh pasien STEMI yang akan dilakukan tindakan PCI selama rentang waktu penelitian yaitu dari bulan september hingga november 2022. Teknik sampling yang digunakan merupakan total sampling karena populasi kurang dari 30. Analisa data akan menggunakan spearman karena data berskala nominal dan ordinal. Hasil: hasil signifikansi adalah sebesar 0,01 atau > dari 0,05 maka kedua faktor tersebut memiliki korelasi. Kemudian untuk nilai correlation coefficient adalah sebesar 0,342. Nilai tersebut menunjukkan nilai korelasi lemah karena berada antara 0,26 hingga 0,5. Arah korelasinya adalah positif (+) yang berarti korelasi searah. Kesimpulan: terdapat korelasi antara pemilihan kategori triase yang dilakukan oleh perawat IGD dengan system delay yang terjadi di IGD RS umum pusat Haji Adam Malik Medan

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### INTRODUCTION

ST Elevation Myocardial Infarction is a disease caused by narrowing of the blood vessels in the heart which causes myocardial infarction or death of the heart muscle (Palasubramaniam et al., 2019). The main treatment for STEMI patients is PCI (Percutaneous Coronary Intervention). This action is in the form of placing a ring on the heart to widen the blood vessels that have narrowed due to STEMI disease (Anggreni, 2021).

PCI action is considered quite effective and able to save patient mortality, especially if it is done immediately (Wang et al., 2011). If done properly and according to the procedure some patients may not require high acuity treatment or long hospitalization after successful PCI (Ebinger et al., 2018). Time is the main key in handling STEMI (Murugiah et al., 2022). STEMI patients who come to the hospital will immediately be given an assessment for action since the patient is in the emergency room or referred to another hospital that has facilities for performing PCI (Bansal et al., 2014).

The process that occurs in the emergency room is a crucial process for handling STEMI. The delay begins with the patient not realizing the early symptoms he is feeling and ignoring them. This is the biggest obstacle in the management of STEMI which places great emphasis on timeliness. In the United States, the time from onset of signs and symptoms to the mean time to first medical contact (FMC) by EMS was 87 minutes and 120 minutes when the patient presented directly to the emergency department (ED) (Jacobs et al., 2021) . STEMI morbidity and mortality could be significantly reduced if patients and their caregivers recognized symptoms early, activated the EMS system, and thereby shortened the time to definitive treatment. Patients with possible STEMI symptoms should be transported to the hospital by ambulance rather than by friends or relatives because there is a significant association between arrival at the emergency department (ED) by ambulance and early reperfusion therapy (Antman, 2008) .

When the patient is in the emergency room, it should be the time the diagnosis is made in the patient and it is decided to take further action. In this process, health workers will be very dependent on time so that any delay will affect the patient's health (Guzmán et al., 2019) .

Delay or *delay* will be very detrimental to the patient if it occurs, especially if it occurs when the STEMI patient is in the ER. This *delay* is also called *System delay* because it occurs when the patient is in the hands of medical personnel (Ibanez, 2018). One of the things that might cause system delays in the ED is the selection of triage categories for STEMI patients. The triage chosen for the patient will determine the patient's waiting time and the urgency of the patient to be treated which allows the patient to wait longer if placed in category 2 or category 3 while STEMI patients require immediate treatment (Saban et al., 2020) . Some patients require laboratory tests such as chest photos and blood tests to help confirm the diagnosis of STEMI (Armstrong, 2004). The length of time this examination is carried out causes the patient to have to wait and causes a *system delay*.

Triage is grouped based on the symptoms experienced by the patient. Recognized typical symptoms of *STEMI* such as chest pain will help the triage nurse categorize *STEMI patients* into triage (Casarin, 2022). Incorrect selection of triage by the nurse will result in lengthening the patient's *Door to Ballon time* (Saban et al., 2020) . Triage does not specifically recognize patients with potential ischemic heart problems except for typical symptoms, besides that triage also has waiting times that vary at each level. At the first level or category 1, the waiting time is 10 minutes and category 2 is 30 minutes. Patients with category 1 are patients who must be resuscitated immediately. Most likely *STEMI patients* will fall into category 2 (su, 2021).

Adam Malik Medan Hajj Center General Hospital is a type A hospital in Medan City that provides PCI services for STEMI patients. STEMI patients who come to the Emergency Room at Adam Malik Hospital will be scheduled for PCI as soon as the diagnosis is made. Reducing patient delay has major implications for the prognosis of patients with STEMI. Research continues to be conducted to help find new things that can reduce death and disability due to system delays experienced by STEMI patients (Pereira et al., 2018) . Therefore it is necessary to do an analysis to find out the relationship between the selection of the triage category and the *delay system* in STEMI patients in the emergency room at Adam Malik Hospital Medan.

## METHODS

This research is a quantitative study using an analytic observational design with a *cross-sectional type* . In this study, observations were made of the effect of selecting the triage category with the *delay system for STEMI* patients in the emergency room. The population in this study are all STEMI patients who will be undergoing PCI during the study period, from September to November 2022. The sampling technique used is total sampling because the population is less than 30 people with inclusion criteria:

1. Patients with a diagnosis of *STEMI* either refer or come directly to the hospital.
2. The patient is an indication for PCI and is scheduled for PCI.
3. Patients are willing to become research samples and fill out informed consent
4. The patient did not die in the process of being treated in the emergency room.

Data analysis will be carried out using SPSS 2.4 and analysis to determine the correlation between the dependent and independent variables will use Spearman because the data is nominal and ordinal scale.

## RESULTS AND DISCUSSION

This research was conducted at the Emergency Room of the Adam Malik Haji Center General Hospital in Medan. There were 86 respondents with a research time span from September to November 2022. 86 respondents had the following characteristics.

**Table 1. Frequency distribution of the demographic characteristics of the respondents**

No	Characteristics	N	%
1	Gender		
	1. Male	72	83.7%
	2. Woman	14	16.3%
2	Age		
	1. 40-49	20	23.3%
	2. 50-59	37	43 %
	3. 60-69	25	29.1%
	4. > 69	4	4.7%
3	Profession		
	1. Housewife	11	12.8%
	2. Retired	9	10.5%
	3. Self-employed	19	22.1%
	4. civil servant	12	14.0%
	5. Farmer	25	29.1%
	6. Doesn't work	10	11.6%

Based on the table above, it can be seen the frequency distribution of respondents based on age, gender, occupation, medical history and onset of STEMI. for the gender category, the highest number was male with a frequency of 72 respondents or 83.7%. In the age category, the most numerous age group was the 50-59 year age group, namely 37 respondents or 43% of all respondents. Then in the occupational category, the highest frequency is farmers and entrepreneurs, namely as many as 25 and 19 respondents or 29.1% and 22.1%.

Triage used in the Emergency Room at Adam Malik Hospital has 4 categories, namely red as the first category,

yellow as the second category, green as the third category and black as the fourth category. Patients who enter are sorted by severity and those who are classified as very severe and require immediate action are put in the first category or red and so on and black is specifically for patients who have died.

**Table 2. Frequency distribution of triage categories of respondents**

No	Variable	n	%
1	trriage category		
	1. Category 1 (Red)	32	37.2%
	2. Category 2 (Yellow)	42	48.8%
	3. Category 3 (Green)	12	14.0%

From the table above, it can be concluded that the highest frequency of triage categories is category 2 or yellow, namely 42 respondents or 48.8%.

**Table 3. Frequency distribution of system delay experienced by respondents**

No	Variable	n	%
1	<i>System delays</i>		
	1. Experiencing <i>system delays</i>	60	69.8%
	2. No <i>system delays</i>	26	30.2%

Based on the table above, it can be concluded that as many as 60 STEMI patients in the ED experienced *system delay* (69.8).

To find out the relationship between the triage factor and *system delay* in the emergency room, a statistical test was carried out using *Spearman* because the data tested used an ordinal and nominal scale.

**Table 4. Table of the results of the analysis of the relationship between the triage factor and the *system delay***

n	P-value	r
86	0.01	,342

Based on the table above, the results show that the significance result is 0.01 or > 0.05, so the two factors have a correlation. Then the correlation coefficient value is 0.342. This value indicates a weak correlation value because it is between 0.26 and 0.5. The direction of the correlation is positive (+), which means the correlation is unidirectional

## DISCUSSION

One of the things that influence the selection of triage is the pre-hospital stage. Patients who pass this stage have a high probability of being prioritized in the emergency room because during the pre-hospital stage, paramedics have carried out assessments and other actions that allow early recognition of STEMI have been carried out. With the discovery of suspicions that the patient has STEMI, immediate action will be taken to enforce the diagnosis, such as a 12-lead EKG that can be done in the emergency room. A

detailed history taken at the scene can provide meaningful information to the ED staff, who can use this information to guide the assessments performed, thus speeding up the clinical process. In the STEMI treatment protocol, ECG leads should be able to be done in the ambulance to reduce time and speed up the patient getting to the catheterization lab (Song et al., 2022) . The results of research in Australia show that the application of EKG in Ambulance has good results. Patients can be transferred directly to the catheterization laboratory upon arrival at the hospital which facilitates PCI (Song et al., 2022)

The essence of precise triage is to shorten the time span leading to diagnosis and ending with catheterization. EKG is the initial step in establishing a STEMI diagnosis. Shortening the time to ECG tapping is one form of accelerating patients towards catheterization (Birnbbaum et al., 2022) .

Treatment of STEMI patients is a protocol that refers to timeliness. Patients with signs and symptoms of STEMI should be classified as category 1 or 2 according to CTAS (Canadian Triage) (Saban et al., 2020) . When the patient is being assessed for triage selection, the nurse makes the selection according to the patient's complaints. The common symptom of STEMI is chest pain that radiates down the left arm and is usually accompanied by other symptoms. Nurses who lack a keen sense of instinct would not suspect that the patient has STEMI and would place them in either category 2 or 3. Although the current analysis found that heart disease is respiratory related and to be the predominant cause associated with heart attacks in all proportions. the cause will be known quickly even though the frequency of occurrence is much smaller in the emergency room. Thus symptoms of shortness of breath will also be found (Mir et al., 2022)

Another study also showed that 50% of STEMI patients were placed in category 3 patients with CTAS triage. This has no impact on the lengthening of the *door to ECG* but has an impact on *system delay* . The possibility of *delays* that occur is also caused by the density that occurs in the emergency room (Saban et al., 2020) . The results of a study also showed that only 54% of STEMI patients were in the right triage category and stated triage accuracy was related to the symptoms that appeared and the patient's age. In the same study a retrospective study was also carried out and found only 40-70% of patients who were in the right triage accuracy. Accurate selection of patient triage will reduce patient mortality and morbidity (Sanders & DeVon, 2016)

Triage should speed up STEMI patients to get reperfusion therapy immediately. When the diagnosis of STEMI is made by EMS in the prehospital setting and the patient is prioritized for PCI strategy, the patient should be indicated to bypass the ED and the patient be transferred directly to the catheterization laboratory. Patients who skip the ED will save 20 minutes in time from FMC to reperfusion procedures (Ibanez, 2018). Triage classification should not be able to produce adverse results, such as longer waiting times for reperfusion therapy which will then increase the morbidity and mortality of STEMI patients (Saban et al., 2020) .

Several studies have even modified the triage to be able to recognize early symptoms of acute pain which is a common symptom of STEMI patients. Research conducted in Rotterdam-Rijnmond showed an increase in the results of more than 100 people or 64% receiving PCI in less than 90 minutes (Anroedh et al., 2018)

The direction of the correlation coefficient is positive. It can be concluded that the higher the triage category chosen, the longer the *system delay* experienced will also increase. The results of a study stated, All patients who came to the

emergency department at the study site were prioritized upon arrival, based on their main complaint and symptom severity; Patients with symptoms suggestive of an acute coronary event require rapid evaluation. It is essential that there is timely and accurate patient nurse triage to encourage excellent care (Stanfield, 2018).

## RESEARCH LIMITATIONS

This research is limited only to find out how the relationship that occurs between the selection of triage categories of STEMI patients in the ER. Deeper research will show different results and be able to find other causes of system delays that occur in the emergency room.

## CONCLUSIONS AND RECOMMENDATIONS

there is a correlation between the selection of triage categories carried out by emergency room nurses and the delay system that occurs in the emergency department of the Haji Adam Malik General Hospital in Medan. It is necessary to deepen research to examine other factors that also cause system delays that occur in the emergency room. In addition, demographic data can also be developed for further research

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