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The Relationship between Incoming Patient Conditions with the Death Rate of Covid-19

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ABSTRACT

Covid-19 cases in 2021 continue to increase with a case fatality rate of 7.17% in East Java. Delays in early detection by patients and families, late referrals and stigma related to Covid-19 cases cause patients to come to the hospital with oxygen saturation <80%, so that patients come already in emergency conditions and are at risk of death.

Purpose – This study aims to analyze the relationship between the incoming patient conditions with the mortality rate of Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya. **Methodology/approach –** The research design used cross sectional. The population in this study was 1159 Covid-19 patients who came to the emergency room and who were hospitalized at Dr. Ramelan Naval Hospital Surabaya in May-July 2021. Samples of 174 patients were taken using systematic random sampling techniques.

Findings – The results showed that the majority of Covid-19 patients who came for treatment were in moderate symptomatic condition by 67.2%, patients came in critical condition by 29.9% and patients with mild symptomatic condition by 2.9%. The results showed that the death of Covid-19 patients in May-July 2021 was 54 patients (31%).

Keywords: Patient Condition, Early Detection, Mortality Rate, Covid-19

INTRODUCTION

Coronavirus is an enormous family of viruses that cause mild to severe symptoms. Coronavirus Disease 2019 (Covid-19) is a new type of disease that has never been identified before in humans. Common signs and symptoms of Covid-19 infection include symptoms of acute respiratory distress such as fever, cough, and shortness of breath. The average incubation period is 5-6 days, with the longest incubation period being 14 days. In severe cases of Covid-19, it can cause pneumonia, acute respiratory syndrome, kidney failure, and even death. Clinical signs and symptoms reported in most cases are fever, with some cases having difficulty breathing, and X-rays showing extensive pneumonic infiltrates in both lungs (Kemenkes RI, 2020).

Covid-19 is a hazardous virus, as evidenced by the current situation of the development of Covid-19, which the Indonesian Ministry of Health reported until June 29, 2021, the global situation of confirmed cases was 181,179,287 people with deaths of 3,930,592 people. Covid-19 cases in Indonesia as of June 29, 2021, a total number was 2,156,465 people, were confirmed, with 58,024 deaths. Meanwhile, in East Java Province itself, as of June 29, 2019, there were 171,830 confirmed cases, with 12,497 deaths (Kemenkes RI, 2021). A preliminary study was conducted by looking at the data on the electronic medical record RSAL dr. Ramelan Surabaya, and it was known that the number of confirmed Covid-19 cases in May - July 2021 was 1159 people, with a mortality rate of 350 people.

Covid-19 cases in 2021 continued to increase due to the high mobility of the population, especially during the Christmas and New Year holidays due to the movement of high-risk groups. In almost all provinces, population mobility in May 2021 (where there are long holidays) was, on average higher than in previous months, resulting in a spike in Covid-19 cases in July 2021 (Badan Litbangkes, 2021).

The addition of daily positive confirmed cases of Covid-19 in Indonesia has decreased. However, death cases have continued to increase. The case fatality rate (CFR) in Indonesia in 2020 reached 3.4%. East Java Province has the highest mortality rate in Indonesia, with a CFR of 7.17% (Sutrisno et al., 2019). In positive cases of Covid-19, it is not only congenital (comorbid) diseases that cause death. Based on the analysis, it has been found that people who are admitted to the hospital have an oxygen saturation below 80%. This differs from when patients with 90% - 93% oxygen saturation were rushed to the hospital for treatment (U. H. Fata & L. Febriana, 2021). This can happen because public education regarding Covid-19 still needs to be improved. Hence, knowledge of the condition of Covid-19 patients, like what should be immediately brought to health services, still needs to be better socialized. (A. D. Haq et al., 2021). It is also supported by the refusal of the community itself to be taken to health services due to various considerations, one of which is the negative stigma from the community about Covid-19 patients.

Social stigma in the context of health is a negative relationship between a person or group of people who share certain characteristics and certain diseases (WHO, 2020). Stigma can be: 1) Encourage hiding the disease in an effort to avoid discrimination, 2) Prevent people from seeking immediate health care, and 3) Prevent them from adopting healthy behaviors. The negative stigma that arises in Covid-19 sufferers is that people around the patient tend to stay away and do not want to be involved in contact with the patient or the patient's family even though they have been declared cured (R. Abudi et al., 2020). This causes most Covid-19 patients who come to the hospital to be in an emergency situation. Late referrals due to various obstacles can also increase the risk of severity of Covid-19 patients who want to be taken to the hospital (Sutrisno et al., 2019). As a result, there have been many cases of death due to Covid-19 cases due to delays in bringing treatment to healthcare facilities, especially in East Java Province

Existing literature has identified several key predictors of increased COVID-19 mortality risk among hospitalized patients. Older age, a history of pneumonia, and certain underlying conditions like diabetes with complications, cancer, interstitial lung disease, chronic obstructive pulmonary disease, lung cancer, and delayed treatment have been consistently identified as important risk factors. (Estiri et al., 2021). These findings supported by Assal, et al (2022) in which cases with COVID-19 pneumonia, 38.3% had a severe and critical disease, resulting In-hospital mortality occurred by 19.4% of the cases with more than half of the cases (62.9%) needed supplemental oxygen.

Emerging data suggest variability in susceptibility to COVID-19 infection and associated outcomes, with a number of patient-related factors, socioeconomic conditions, racial and ethnic differences, and several comorbidities including obesity, diabetes, and cardiovascular diseases being associated with higher susceptibility and/or risk of mortality (Fillmore et al., 2020). One study aimed to identify pre-hospital-admission patient characteristics that are relatively highly related to subsequent COVID-19 mortality, such as demographic variables and premorbid conditions, which could affect mortality amongst patients hospitalized with COVID-19 but occurred prior to the development of severe disease. (Baker et al., 2023). Triage condition at the time of hospital presentation, which reflects the patient's overall health status and disease severity, is a crucial determinant of their subsequent mortality risk. Most COVID-19 patients who come to the hospital in an emergency setting are likely already in a severely compromised state, often with multiple underlying conditions that predispose them to poorer outcomes (Wee et al., 2020). Based on the problems above, the writers are interested in analysing the relationship between the patients' condition when they came for treatment and the mortality rate of Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya.

METHOD

This research design uses cross-sectional to analize the patient's condition when coming for treatment with the death rate of Covid-19 patients. This study used a document analysis in the electronic medical records of Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya in May-July 2021. The independent variable in this study is the patient's condition when coming for treatment at Dr. Ramelan Naval Hospital Surabaya and the dependent variable is the death rate of Covid-19 patients. The population in this study were Covid-19 patients who came to the emergency room and who were hospitalized at Dr. Ramelan Naval Hospital Surabaya in May-July 2021 as many as 1159 patients. The population in this study was categorized into > 1000, so the sample size taken was 15% of the population, namely 15% x 1159 = 174 patients. The sampling technique in this study was systematic random sampling. Sampling was used to determine the medical record files of all patients who came to the emergency room of Dr. Ramelan Naval Hospital Surabaya in May-July 2021. The statistical analysis used in this study was the Chi-Square crosstabs test with a significance level of <0.05.

RESULT AND DISCUSSION

The Sociodemographic data of patients treated at Dr. Ramelan Naval Hospital Surabaya in May – July 2021 can be seen in Table 1 below.

Table 1. Demographic Data of Covid-19 Patients at Dr. Ramelan Naval Hospital Surabaya in May-July 2021

No	Characteristics of Respondents	Criteria	Frequency (f)	Percentage (%)
1	Age	11 – 20 years old	19	10.9
		21 – 30 years old	32	18.4
		31 – 40 years old	34	19.5
		41 – 50 years old	27	15.5
		51 – 60 years old	31	17.8
		61 – 70 years old	17	9.8
		71 – 80 years old	14	8.0
		Total	**174**	**100.0%**
2	Gender	Men	83	47.7
		Women	91	52.3
		Total	**174**	**100.0%**
3	Education	Elementary School	25	14.4
		Junior High School	29	16.7

No	Characteristics of Respondents	Criteria	Frequency (f)	Percentage (%)
		Senior High School	64	36.8
		Bachelor/Diploma	43	24.7
		Other education	13	7.5
		Total	**174**	**100.0%**
4	Job	Civil servants	24	13.8
		Private employees	44	25.3
		Member of the Indonesian Navy	30	17.2
		Other occupations	76	43.7
		Total	**174**	**100.0%**

Table 1 shows that Covid-19 patients who were treated in the emergency room and who were hospitalized at Dr. Ramelan Naval Hospital Surabaya in May – July 2021 mostly aged 31 – 40 (19.5%), primarily women (52.3%), senior high school educated (36.8%), with most working other than civil servants, private employees or members of the Indonesian Navy (other occupations) by 43.7%.

Table 2. Triage Condition of Covid-19 Patients at Dr. Ramelan Naval Hospital Surabaya on May – July 2021

Condition	Frequency (f)	Percentage (%)
P3	5	2.9
P2	117	67.2
P1	52	29.9
Total	**174**	**100.0%**

Table 2 shows that the condition of Covid-19 patients when they came to the emergency room at Dr. Ramelan Naval Hospital Surabaya was mostly categorized in moderate condition (P2) with 117 patients (67.2%) and critical condition (P1) with 52 patients (29.9%).

Table 3. Mortality Rate of Covid-19 Patients at Dr. Ramelan Naval Hospital Surabaya in May-July 2021

Mortality Rate	Frequency (f)	Percentage (%)
Recover	120	69.0
Die	54	31.0
Total	**174**	**100.0%**

Table 3 shows that the majority of Covid-19 patients seeking treatment at Dr. Ramelan Naval Hospital Surabaya, in May-July 2021, returned home recovering (69%). However, it cannot be denied that the death rate for Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya in May-July 2021 was quite large, namely 54 patients (31%).

Table 4. Mortality Rate of Covid-19 Patients seen from the Patient's Condition when came at the emergency room at Dr. Ramelan Naval Hospital Surabaya

Condition	Recover		Die		Total	
	f	%	F	%	n	%
P3	5	100	0	0	5	100
P2	87	74.4	30	25.6	117	100
P1	28	53.8	24	46.2	52	100
Total	**120**		**54**		**174**	
statistical test value *Chi-Square* 0.009 (p < 0.05)						

Table 4 shows that patients who came to the hospital in May - July 2021 with a P3 condition that was 100% cured. It was known that Covid-19 patients who came for treatment with mild conditions could recover quickly and leave the hospital in good health.

Patients who came to the hospital with P2 condition recovered 87 (74.4%) and died as many as 30 (25.6%). It was known that most patients who came for treatment in moderate conditions recovered and could leave the hospital in a recovered condition. However, it required a longer treatment time to recover compared to patients with triage criteria P1. Even so, Covid-19 triage P2 patients were discharged from the hospital dead. Health workers have maximized the maximum effort for treating these patients, but the influencing factors were the patient's health condition which gradually worsens while in treatment.

There were 28 (53.6%) patients who came to the hospital with P1 condition recovered, and 24 (46.2%) died. It was known that Covid-19 patients who were in triage P1 when admitted to the hospital were already in critical condition. The condition of Covid-19 patients when they were discharged from the hospital was almost a balance between recovery and death. It could be said that patients with triage P1 have a higher risk of dying.
Coronavirus Disease 2019 (Covid-19) is a new type of disease that has not been previously identified in humans. Common signs and symptoms of Covid-19 infection include symptoms of acute respiratory distress such as fever, cough, and shortness of breath. Some research findings showed that the characteristics of the respondents, which include age, gender, education, and job, did not significantly affect either the knowledge or the mortality rate of Covid-19 patients (H. Muryawan et al., 2021). However, several studies showed that some of these characteristics could be related, but the following statement could not be used as a reference.

The age of 31-40 is an adult age with good enough individual considerations or mindset to form a mature mindset. Age was not an inhibiting factor for having a mindset in obtaining information about Covid-19 because differences in age groups made it possible to have the same persistence and exposure to information (T. Winugroho et al., 2021). However, most of this adult age group had relatively high mobility with a history of traveling out of town, which was also relatively frequent. This high mobility caused the adult (productive) population to have more frequent contact with outsiders. It came into contact with public places, so they were more vulnerable to being exposed to Covid-19 (Styawan, 2020).

Based on the finding of the study, it was found that the proportion of Covid-19 exposure was almost equal between women (52.3%) and men (47.7%), but in these data, the proportion was higher in women. This could be because, nowadays, the stigma is changing where women work apart from being housewives (multiple roles). Thus, activities outside the home are high, such as health workers, traders, employees, and so on (Supandi et al., 2021). However, different things were also conveyed that men were more susceptible to exposure to Covid-19 because, besides the main factor, men were working, so they left the house more often. Other factors were chromosomal and hormonal factors; women had the X chromosome and the hormone progesterone, which provided innate and adaptive immunity. Women have better knowledge about risk factors for Covid-19 than men. Male lifestyle can also be a contributing factor, such as drinking alcohol and smoking habits, which can reduce immunity in the body, especially in fighting exposure to the Covid-19 virus (A. Ernawati, 2021).

The proportion of exposure to Covid-19 patients who came to the emergency room and was hospitalized at Dr. Ramelan Naval Hospital Surabaya graduated from high school (36.8%) with jobs primarily as entrepreneurs, housewives, and so on (43.7%). Education is closely related to work, and there is a connection with knowledge of Covid-19. Entrepreneurs, housewives, and jobs other than in an organization or office are vulnerable to Covid-19 exposure due to bad reception of information, difficulty distinguishing correct or incorrect information, and tend to receive it directly without filtering it. Another influence was the ability to understand health literature and exposure to information related to health promotion which was considered lacking at the senior high school level and below (H. Muryawan et al., 2021). However, other works of literature state that information media has a positive

impact that can affect a person's knowledge; even though a person has a low level of education, if he gets good information from various media, it will increase his knowledge (Said and Ropiah, 2021).

Early detection was not going well could be a factor due to the lack of education to the public regarding Covid-19, so knowledge of the condition of Covid-19 patients that should be immediately taken to health services was still not well socialized (A. D. Haq et al., 2021). It was also supported by the community's refusal to be taken to health services due to various considerations, one of which is the negative stigma from the community towards Covid-19 patients (Abudi et al., 2020). This caused the majority of Covid-19 patients who came to Dr. Ramelan Naval Hospital Surabaya was already in a state of emergency.

The handling of Covid-19 patients in the triage category P3 (good condition) was monitored for the patient's condition. Giving vitamin C for the next 14 days, with a choice of non-acidic C tablets 500 mg/6-8 hours orally (for 14 days), vitamin C lozenges 500 mg/12 hours orally (for 30 days), a multivitamin containing vitamin C is recommended, B, E, and Zinc. Giving vitamin D supplements: 400 IU-1000 IU/day (available in the form of tablets, capsules, effervescent tablets, chewable tablets, lozenges, soft capsules, powder, syrup), medicine: 1000-5000 IU/day (available in tablet form 1000 IU and 5000 IU chewable tablets), in addition to giving vitamins are also given Azithromycin 500 mg 1x per day for 5 days. Giving antivirus such as Oseltamivir (Tamiflu) 75 mg/12 hours/oral for 5-7 days (especially if influenza infection is suspected) or Favipiravir (Avigan preparation 200 mg) loading dose 1600 mg/12 hours/oral day 1 and after that 2x600 mg (day 2-5). Symptomatic treatment was paracetamol for fever (PDPI et al., 2020).

The handling of Covid-19 patients in the triage category P2 (moderate condition) was monitored by isolating the patient in the Covid-19 patient care room. Patients were advised to have complete rest, adequate caloric intake, electrolyte control, hydration status/fluid therapy, and oxygen. In addition, laboratory monitoring of Complete Peripheral Blood was also carried out with a type count, if possible, adding CRP, kidney function, liver function, and thoracic muscles periodically. Giving vitamin C 200-400 mg/8 hours in 100 cc of 0.9% NaCl ran out in 1 hour given intravenous drip (IV) during treatment. In addition to vitamins, Azithromycin 500 mg/24 hours per iv or orally (for 5-7 days) or Levofloxacin could be given if a bacterial infection was suspected: a dose of 750 mg/24 hours per iv or orally (for 5-7 day), plus an antiviral such as Favipiravir (Avigan 200 mg preparation) loading dose of 1600 mg/12 hours/oral day 1 and after that 2x 600 mg (days 2-5) or Remsedivir 200 mg IV drip (day 1) followed by 1x100 mg IV drip (days 2-5 or days 2-10). Patients were also given symptomatic treatment and treatment of existing comorbidities and complications (PDPI et al., 2020).

The handling of Covid-19 patients in the triage category P3 (critical condition) was monitored by isolating the patient in the Covid-19 patient care room. Swab collection for PCR was carried out on days 1 and 2 for diagnosis. Patients were advised to have complete rest, adequate caloric intake, electrolyte control, hydration status/fluid, oxygen therapy, and complete peripheral blood laboratory monitoring along with a type count. Please periodically add CRP, kidney function, liver function, Hemostasis, LDH, and D-dimer. Check serial chest X-ray to see if worsening. The event of respiratory failure requiring mechanical ventilation, shock, or multi-organ failure requires ICU treatment. If ARDS accompanies respiratory failure, consider using a mechanical ventilator. Prevention of disease worsening can use high flow nasal cannula (HFNC) or noninvasive mechanical ventilation (NIV); in patients with ARDS or large pulmonary effusion, HFNC was more recommended than NIV. Limitation of fluid resuscitation, especially in patients with pulmonary edema, positions the patient in an Awake prone position, Oxygen Therapy (Nasal Cannula, NRM, HFNC), NIV, Ventilator, ECMO. If sepsis was strongly suspected to be due to a bacterial infection, the selection of antibiotics was adjusted to the clinical condition, the focus of infection, and the risk factors present in the patient. Blood cultures should be examined, and sputum culture examination (with special caution) should be considered. If shock

occurs, treat shock according to existing shock management guidelines. Other supportive drugs could be given additional therapy, according to the patient's clinical condition and availability at each healthcare facility, if standard therapy did not respond to improvement. Administration with careful consideration and in discussion with the hospital's COVID-19 team. For example, anti-IL 6 (tocilizumab), convalescent plasma, IVIG or Mesenchymal Stem Cells (MSCs)/stem cells, plasma exchanged therapy (TPE), and others (PDPI et al., 2020).

Appropriate triage application could affect staff's response time in handling patients. If triage were not carried out correctly, it would reduce the response time received by patients, thereby increasing the risk of organ damage or disability and even patient death. In addition, it would also affect the quality of hospital health services and increase medical costs for these patients (Kemenkes RI, 2020).
Factors of healing action, social support, and knowledge could influence the recovery rate of Covid-19 patients. The healing action in the form of the TS1 indicator (willing to undergo a treatment period of approximately 14 days) had the greatest loading factor value of 0.924. Social support in the form of the DS1 indicator (getting expressions of empathy, concern, and attention given by officers to sufferers of Covid-19) had the largest loading factor value of 0.741. Knowledge in the P7 indicator (curing patients, preventing and reducing transmission and death rates) had a loading factor value of 0.767 (Rahmi et al., 2022). Thus, the handling factors of health workers greatly influence the recovery of Covid-19 patients in addition to the health conditions of these patients. Judging from the large percentage of recovered Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya could be said that medical treatment from health workers had been good.

Meanwhile, the mortality rate of Covid-19 patients can be influenced by several things, namely gender, shortness of breath symptoms, comorbid history as well as case severity. Male Covid-19 patients had a 2.3 times greater risk of death than female Covid-19 patients. Covid-19 patients who had shortness of breath symptoms have a 4.1 times greater risk of death compared to Covid-19 patients who did not experience shortness of breath symptoms. Covid-19 patients with a history of comorbidities had a 2.5 times greater risk of death than those without comorbidities. Furthermore, Covid-19 patients classified as severe cases have a 5.3 times greater risk of death compared to patients not classified as severe cases (Simatupang, 2021). Thus, the highest emphasis on the death factor for Covid-19 patients was on the condition of the Covid-19 patient itself.

Based on the chi-square statistical test analysis results, the number was 0.009 (P-value <0.05), which meant that statistically, there was a significant relationship between the patient's condition when they came to the emergency room and the death rate of Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya. This was supported by research from Spain that triage for the condition of Covid-19 patients was related to the patient's death rate. The triage was applied using a chest x-ray (CXR) to screen non-critical patients with suspected Covid-19 pneumonia in the emergency department. Covid-19 patients with negative CXR were sent home so that the death of Covid-19 patients could be suppressed in 10 (2%) of 523 Covid-19 patients with pneumonia and 1 patient (0.003%) of 311 patients with negative CXR results (Gonzalez, 2022).

On the other hand, research states that triage was closely related to response time. The higher the patient's emergency level, the faster the response time (Rumampuk and Katuuk, 2019). Therefore, accuracy in the triage of Covid-19 patients was an absolute necessity so that patient treatment could run smoothly and the mortality rate due to the Covid-19 virus could be reduced. Using the CXR triage model for Covid-19 patients with early suspected pneumonia would be highly accurate, and patients with a negative result could be discharged with a low complication rate.

CONCLUSION

The condition of the Covid-19 patient who came for treatment at Dr. Ramelan Naval Hospital Surabaya in May - July 2021, mostly with moderate symptom conditions (P2), with a relatively high mortality rate with 54 patients. The patient's condition when they came to the emergency room was significantly related to the mortality rate of Covid-19 patients at Dr. Ramelan Naval Hospital Surabaya with chi-

square value p=0.009. Thus, the researchers expect that medical staff can quickly triage infected Covid-19 patients classified as P3 (mild condition), P2 (moderate condition), and/or P1 (severe condition) so that patient care can run smoothly and the mortality rate due to the Covid-19 virus can be reduced.

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