

## Profile of Elderly COVID-19 Patients at Indrapura Field Hospital, Surabaya

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### ABSTRACT

**Introduction:** Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a pathogen that causes coronavirus disease (COVID-19). The elderly, especially those with comorbidities, are vulnerable to COVID-19. This study aimed to determine the profile of elderly patients with COVID-19 and to provide valuable data for further research.

**Methods:** This was a retrospective descriptive study of 132 (n=132) elderly COVID-19 patients at Indrapura Field Hospital, Surabaya, between April and October 2021. The clinical profile was determined by collecting medical record data from Indrapura Field Hospital, Surabaya. All statistical data analyses were conducted using the International Business Machines Corporation (IBM) Statistical Package for Social Sciences (SPSS) for Macintosh version 25.0.

**Results:** This study indicated that among 132 (n=132) elderly patients, the predominated age range was 61–63 years old (37.12%), and most of the patients were males (57.6%). The majority of the patients' occupations were private employees, and hypertension was the main comorbidity in elderly patients (52.3%). Most patients experienced mild symptoms (46.2%), with the most common complaint being a productive cough (42.4%). All of the patients had no antiviral, antibacterial, or corticosteroid therapy. There were 73 patients (55.3%) who had been hospitalized for less than 10 days, with most of the patients (78.79%) cured and allowed to go home.

**Conclusion:** The majority of patients at Indrapura Field Hospital, Surabaya, were elderly male patients, with hypertension being the most common comorbidity. Most patients exhibited mild symptoms, mainly a productive cough, and showed significant improvement with symptomatic, isolation, relaxation, nutrition, and observation (SIRNO) therapy, resulting in a high recovery and discharge rate.

### Highlights:

1. Elderly patients with comorbidities are more vulnerable to coronavirus disease (COVID-19) because it can cause a higher mortality rate and a poor prognosis.
2. Most of the elderly COVID-19 patients who were given symptomatic treatment were cured.

### ARTICLE INFO

#### Article history:

Received 16-11-2022

Received in revised form  
18-11-2024

Accepted 17-12-2024

Available online 10-01-2025

#### Keywords:

COVID-19,  
Elderly,  
Infectious disease,  
Profile.

#### Cite this as:

Mahdian H, Triyono EA, Handajani NI, Kartina L. Profile of Elderly COVID-19 Patients at Indrapura Field Hospital, Surabaya. Juxta J Ilm Mhs Kedokt Univ Airlangga 2025; 15: 7–13.

## Introduction

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a pathogen that causes coronavirus disease (COVID-19). Due to its exceptionally rapid spread and high mutability, COVID-19 has caused morbidity and mortality on a global scale, becoming known as a pandemic.<sup>1</sup> The most common effect of COVID-19 is on the respiratory system, but COVID-19 can attack other organ systems, such as the gastrointestinal, central nervous, and cardiovascular systems.<sup>2</sup>

Aging is a natural process that everyone experiences approximately after the age of thirty. The human body undergoes a progressive physiological decline that reduces the ability to maintain homeostasis during stressful conditions.<sup>3</sup> The immune system experiences significant alterations throughout the aging process. This could increase the risk of autoimmune diseases and impair the body's defenses against cancer and infection.<sup>4</sup> During aging, the immune system, both innate and adaptive, deconstructs and remodels, causing a phenomenon known as immunosenescence.<sup>4</sup>

Inflamm-aging is a chronic low-grade inflammation related to aging that expresses high levels of pro-inflammatory markers.<sup>5</sup> Both immunosenescence and inflamm-aging can worsen the outcomes of COVID-19.<sup>6</sup> The elderly are a group that is susceptible to COVID-19, especially the elderly who have comorbidities.<sup>7</sup> Aside from aging, the presence of comorbidities like diabetes, lung diseases, hypertension, and obesity may lead to disease complications like severe pneumonia and acute respiratory distress syndrome (ARDS).<sup>8</sup> According to a recent investigation, it was found that SARS-CoV-2 can cause higher mortality rates and worse prognoses in elderly patients, increasing the risk of developing severe COVID-19 in the presence of a cytokine storm that could lead to sepsis.<sup>9</sup>

Higher mortality rates in the elderly were also seen in sepsis cases. Studies show that mortality rates of elderly sepsis patients were 2.3 times higher.<sup>10</sup> Sepsis could also occur in COVID-19 patients with secondary bacterial or fungal infections.<sup>9</sup> The COVID-19 pandemic also resulted in a significant reduction in hip and knee arthroplasty surgeries often conducted in elderly patients within the age of 60.<sup>11</sup>

The Kogabwilhan II Indrapura Field Hospital, Surabaya, was an emergency hospital that specifically treated patients with COVID-19. Initially, this hospital was dedicated to treating patients with confirmed COVID-19 through positive polymerase chain reaction (PCR) results who had no symptoms and mild symptoms. However, this hospital also treated patients with severe symptoms during the outbreak of COVID-19 cases in Indonesia. Most of the patients treated at this hospital came from East Java. Therapies such as antibiotics and antivirals were not given to patients in this hospital. Instead, the main therapy used was the symptomatic, isolation, relaxation, nutrition and observation (SIRNO) therapy.<sup>12</sup> Only a few studies have examined the profile of elderly COVID-19 patients at Indrapura Field Hospital, Surabaya. Therefore, this study

aimed to assess and evaluate the characteristics of elderly COVID-19 patients at Indrapura Field Hospital, Surabaya, considering that the highest mortality rate in COVID-19 patients is in the elderly.<sup>13</sup>

## Methods

This was a descriptive retrospective study.<sup>14</sup> The subjects were COVID-19 patients admitted to Indrapura Field Hospital, Surabaya, between April and October 2021 (n=132). Diagnosis of COVID-19 was confirmed using a nasal swab real-time PCR (RT-PCR). The patients' age was limited to only those above 60 years old. Data regarding the patient's profiles were taken from medical records. All demographic data, including basic information (age, sex, and occupation), were gathered from the electronic medical records. Data regarding clinical examinations, anamneses, and the patient's medical history, including any pre-existing comorbidities, were documented.

Data regarding the patients' clinical characteristics from the medical records were acquired, including symptoms such as dry cough, productive cough, fever, myalgia, headache, shortness of breath, sore throat, diarrhea, nausea, vomiting, rhinorrhea, anosmia, abdominal pain, sleeping disorder, anxiety, therapy, and its results. When obtaining data from medical records, a structured checklist was performed to ensure comprehensive information for this study. In this study, the data gathered was further organized using Microsoft Excel 2021.<sup>15</sup> Original data backups were also performed before executing any modifications. Data validation requires imposing limits on data to ensure consistency. Any missing or incorrect data were also found and examined throughout the data cleaning process.

To eliminate any data duplicates, each patient's medical record numbers were also collected and standardized to guarantee the consistency and validity of the dataset. Frequencies and percentages were used to characterize the categorical variables. All statistical results were considered descriptive only because the patients in this study were not randomly selected. Data analysis was then processed using the International Business Machines Corporation (IBM) Statistical Package for Social Sciences (SPSS) for Macintosh version 25.0 and presented as tables and text.<sup>16</sup>

This study obtained ethical clearance and was approved by the Ethics Committee of the Faculty of Medicine, Universitas Airlangga, Surabaya (registration number: 67/EC/KEPK/FKUA/2022). Each patient also gave written informed consent for the use of their data for research purposes. To protect patient confidentiality, only researchers involved in this study can access the patient's data.

## Results

According to the underlying data, [Table 1](#) displays the demographic information for 132 patients who met the inclusion criteria of this study between April and October

2021. The most frequent age range was between 61–63 years old (37.1%), consisting of 49 patients. On the other hand, 17.4% were 60 years old, 22.7% were 64–66 years old, 12.1% were 67–69 years old, and the rest were over 70 years old (10 patients), becoming the least common age range. In terms of patient occupation demographics, 66 patients (50%) were private employees, followed by 39 patients (29.5%) who were teachers, 10 patients (7.6%) who were civil servants, 1 patient (0.8%) served in the military and police, and 1 patient (0.8%) was a housewife.

Table 1. Demographics data of elderly coronavirus disease patients at Indrapura Field Hospital, Surabaya

Patient Demographics (n=132)	Value (%)
<b>Sex</b>	
Female	56 (42.4%)
Male	76 (57.6%)
<b>Age</b>	
60 years old	23 (17.4%)
61-63 years old	49 (37.1%)
64-66 years old	30 (22.8%)
67-69 years old	16 (12.1%)
More than 70 years old	14 (10.6%)
<b>Occupation</b>	
Civil servant	10 (7.6%)
Military and police	1 (0.8%)
Private employee	66 (50%)
Teacher	39 (29.5%)
Housewife	1 (0.8%)
Others	15 (11.4%)

Source: Research data, processed

Table 2 represents the medical history of the patients. One hundred three patients (78%) had one or more preexisting comorbidities. Hypertension was the most common comorbidity, occurring in 69 (52.3%) individuals, followed by grade 1 obesity (30.3%), diabetes mellitus (16.7%), grade 2 obesity (9.1%), cardiovascular diseases (3%), diseases of eye adnexa (2.3%), asthma (1.5%), lymphoma (1.5%), and others (various other comorbidities such as benign prostate hyperplasia, gastritis, and cerebrovascular accident).

Table 2. Medical history of elderly coronavirus disease patients at Indrapura Field Hospital, Surabaya

Medical History (n=132)	Value (%)
<b>Comorbidity</b>	
No comorbidity	29 (22%)
One comorbidity	59 (44.7%)
Two comorbidity	34 (25.7%)
Three comorbidity	10 (7.6%)
Hypertension	69 (52.3%)
Diabetes mellitus	22 (16.7%)
Grade 1 obesity	40 (30.3%)
Grade 2 obesity	12 (9.1%)
CVDs	4 (3%)
Diseases of eye and adnexa	3 (2.3%)
Asthma	2 (1.5%)
Lymphoma	2 (1.5%)
Others (BPH, gastritis, CVA)	3 (2.3%)

Source: Research data, processed

BPH: benign prostate hyperplasia; CVA: cerebrovascular accident

The features of severity and symptoms throughout therapy are outlined in Table 3. Out of the 132 COVID-19 patients treated at Indrapura Field Hospital, Surabaya, 37

(28%) were asymptomatic, 61 (46.2%) had mild symptoms, 5 (3.8%) had moderate symptoms, and 29 (22%) had severe symptoms. Productive cough was the predominant symptom, occurring in 56 patients (42.4%), followed by fever in 27 patients (20.5%), rhinorrhea in 22 patients (16.7%), shortness of breath in 20 patients (15.2%), headache in 19 patients (14.4%), anxiety in 14 patients (10.6%), dry cough in 12 patients (9.1%), sleeping disorder in 7 patients (5.3%), myalgia in 6 patients (4.5%), sore throat in 6 patients (4.5%), diarrhea in 5 patients (3.8%), anosmia in 5 patients (3.8%), abdominal pain in 4 patients (3%), and lastly, vomiting in 2 patients (1.5%).

Table 3. The severity and general symptoms of elderly coronavirus disease patients at Indrapura Field Hospital, Surabaya

Characteristics (n=132)	Value (%)
<b>Severity</b>	
Asymptomatic	37 (28%)
Mild	61 (46.2%)
Moderate	5 (3.8%)
Severe	29 (22%)
<b>General Symptoms</b>	
Dry cough	12 (9.1%)
Productive cough	56 (42.4%)
Fever	27 (20.5%)
Myalgia	6 (4.5%)
Headache	19 (14.4%)
Shortness of breath	20 (15.2%)
Sore throat	6 (4.5%)
Diarrhea	5 (3.8%)
Nausea	14 (10.6%)
Vomit	2 (1.5%)
Rhinorrhea	22 (16.7%)
Anosmia	5 (3.8%)
Abdominal pain	4 (3%)
Sleeping disorder	7 (5.3%)
Anxiety	14 (10.6%)
Others	13 (9.8%)

Source: Research data, processed

Table 4 contains data on therapies administered to the patients. The symptomatic SIRNO therapy method was administered to patients (symptomatic therapy such as antitussive, expectorant, antipyretic, decongestant, antidiarrheal, antiemetic, anticonvulsant, antipsychotic), isolation, relaxation, nutrition, and observation. Patients with comorbidities were also given therapy for their specific conditions. One hundred twenty-four patients (93.9%) received multivitamin therapy, 79 patients (59.8%) received N-acetylcysteine therapy, 37 patients (28%) received nasal decongestant therapy such as pseudoephedrine, 48 patients (36.4%) received paracetamol, 1 patient (0.8%) had mefenamic acid, 35 patients (26.5%) had oxygen (O<sub>2</sub>) therapy, and 42 patients (31.8%) received IV therapy. For gastrointestinal symptoms, 7 patients (5.3%) received attapulgit, 12 patients (9.1%) received domperidone, and 3 patients (2.3%) received ondansetron. Sixteen patients (12.1%) received lorazepam, 14 patients (10.6%) received clobazam, and lastly, 5 patients (3.8%) received risperidone for neuropsychiatric symptoms.

Patients with hypertension comorbidities received amlodipine therapy in 63 cases (47.7%) and candesartan in 21 cases (15.9%). Patients with diabetes mellitus comorbidities received metformin in 11 cases (8.3%),

glimepiride in 4 cases (3%), and insulin in 9 cases (6.8%). Not all patients were given antiviral or antibiotic therapy. This was because there was minimal evidence regarding the efficacy of antiviral drugs in treating SARS-CoV-2, and antiviral drugs for treating COVID-19 were still in clinical trials. In addition, side effects of antiviral administration may alter the body's cells. Thus, the kind, duration, and dose must be accurate. In addition, the virucidal effectiveness of antivirals against SARS-CoV-2 has not been scientifically proven.<sup>17</sup>

Table 4. Therapies that were given to elderly coronavirus disease patients at Indrapura Field Hospital, Surabaya

Therapies (n=132)	Value (%)
<b>Supportive therapy</b>	
Multivitamins	124 (93.9%)
N-acetylcysteine	79 (59.8%)
Ambroxol	4 (3%)
Pseudoephedrine	37 (28%)
Paracetamol	48 (36.4%)
Mefenamic acid	1 (0.8%)
Attapulgit	7 (5.3%)
O <sub>2</sub> therapy	35 (26.5%)
IV therapy	42 (31.8%)
Domperidone	12 (9.1%)
Ondansetron	3 (2.3%)
Lorazepam	16 (12.1%)
Clobazam	14 (10.6%)
Risperidone	5 (3.8%)
<b>Comorbid therapy</b>	
Amlodipine	63 (47.7%)
Candesartan	21 (15.9%)
Metformin	11 (8.3%)
Gilmepidine	4 (3%)
Insulin	9 (6.8%)
<b>Antiviral therapy</b>	0 (0%)
<b>Antibiotic therapy</b>	0 (0%)
<b>Corticosteroids therapy</b>	0 (0%)

Source: Research data, processed  
O<sub>2</sub>: oxygen

Table 5 exhibits the length of stay (LOS) and clinical outcomes of patients. Of the 132 patients, 104 (78.8%) recovered from COVID-19, 4 (3%) patients continued self-isolation, and 24 (18.8%) patients were referred to a higher health facility. No patient died at Indrapura Field Hospital, Surabaya, during hospitalization. Based on the average LOS, the largest number was found in groups <10 days LOS with 73 (55.3%) patients, LOS >10 days had 46 (34.8%) patients, and LOS for 10 days had 13 (9.8%) patients.

Table 5. Length of stay and clinical outcomes of elderly coronavirus disease patients at Indrapura Field Hospital, Surabaya

Characteristics (n=132)	Value (%)
<b>Length of stay</b>	
<10 days	73 (55.3%)
10 days	13 (9.8%)
>10 days	46 (34.8%)
<b>Clinical outcomes</b>	
Cured	104 (78.8%)
Self-quarantine	4 (3%)
Referred	24 (18%)
Died	0 (0%)

Source: Research data, processed

## Discussion

Most patients treated at Indrapura Field Hospital, Surabaya, from April to October 2021 were males. This result aligns well with another study conducted at Dr. Cipto Mangunkusumo General Hospital (RSCM), Jakarta, where male patients were predominant in the elderly group (66%).<sup>18</sup> However, the data obtained in a study conducted at Immanuel Hospital, Bandung, showed that patients were dominated by females (54.2%) instead.<sup>19</sup>

In the group of elderly patients treated at Indrapura Field Hospital, Surabaya, the age range of these patients was fairly wide, from elderly aged 60 years old to 96 years old. In another study at RSCM, there were 30 patients (68%) in the age range of 60-69 years old, whilst 13 other patients were above 70 years old (32%).<sup>18</sup> This study found that 118 patients (89.39%) were 60-69 years old, and 14 (10.61%) were above 70 years old. An analysis based on occupation revealed that most patients were private employees, followed by teachers. These were occupations with a high risk of contact with others, explaining the significantly higher risk of COVID-19 infection. On the other hand, health workers may have the highest chance of getting infected by COVID-19. Nevertheless, it could be reduced by compliance with the use of personal protective equipment (PPE), hand hygiene, limited working hours, less risky procedures, and other environmental factors.<sup>20</sup>

At Semen Padang Hospital, Padang, there were 15 patients (28%) with hypertension comorbidities.<sup>21</sup> A study conducted at RSCM also showed 6 patients with hypertension (14%).<sup>18</sup> Therefore, it can be concluded that in the 3 studies conducted at Indrapura Field Hospital, Surabaya, Semen Padang Hospital, Padang, and RSCM, Jakarta, hypertension was the most prevalent comorbidity among geriatric COVID-19 patients. Patients with hypertension have an increased risk of developing critical conditions that require intensive care.<sup>22</sup>

The severity of COVID-19 patients was classified as asymptomatic, mild, moderate, and severe. There were 37 asymptomatic patients (28%), 61 patients (46.2%) with mild symptoms, 5 patients (3.8%) with moderate symptoms, and the rest of the patients (22%) had severe symptoms. These groups were classified based on the Indonesian Association of Internal Medicine Specialists (PAPDI) guidelines.<sup>23</sup> Patients without typical COVID-19 symptoms were allocated to the asymptomatic group. Mild categories were assigned to patients with mild symptoms (such as fever, cough, and nausea) but no dyspnea. Patients with moderate COVID-19 symptoms may experience pneumonia and oxygen saturation levels below 93%. Patients with pneumonia who exhibited one of the following: respiratory rate more than 30 times per minute, severe respiratory distress, or oxygen saturation below 93% were categorized as severe.<sup>23</sup>

Patients treated at Indrapura Field Hospital, Surabaya, were asymptomatic and had mild symptoms. If the patient's conditions worsen to moderate or severe symptoms, they would be referred to a higher health facility.<sup>12</sup> However, throughout June-July 2021, there was an increase in COVID-19 cases in Indonesia, causing several referral



hospitals treating patients with moderate to severe symptoms to be packed. As a result, Indrapura Field Hospital, Surabaya, ended up treating patients with moderate to severe symptoms as well.<sup>24</sup>

The most frequent symptoms of COVID-19 experienced by elderly patients were fever and cough.<sup>25</sup> This theory was further proven by the data found at Indrapura Field Hospital, Surabaya, with the most common symptoms being productive cough in 56 cases (42.4%) followed by 27 fever cases (20.46%). Five patients reported anosmia, a condition significantly associated with respiratory tract signs and symptoms in COVID-19 patients.<sup>26</sup> A study conducted at RSCM also stated that among 44 patients, 26 patients had cough and fever, respectively.<sup>18</sup> A study conducted at Semen Padang Hospital, Padang, also stated that cough (74%) was the most common symptom followed by fever (37%).<sup>21</sup> The same data was obtained at Dr. Kariadi General Hospital, Semarang.<sup>27</sup> Although the sample in this study was pediatric patients, 38 patients had cough (92.7%), and 37 patients had fever symptoms (90.2%).<sup>27</sup>

The length of treatment for patients treated at Indrapura Field Hospital, Surabaya, was between 1 and 21 days. On average, patients were hospitalized for 8.91 days. Of 132 patients, 73 were treated for less than 10 days, 13 were treated for 10 days, and 46 were hospitalized for more than 10 days. This data differs significantly from those obtained at Semen Padang Hospital, Padang, where the average LoS of treated patients was 14.87 days.<sup>21</sup> Conversely, the average LoS for critical COVID-19 patients in the intensive care unit (ICU) was 10.9 days.<sup>22</sup> A study conducted at Dr. Saiful Anwar General Hospital, Malang, found that patients were treated for a shorter duration of 2.44 days.<sup>28</sup> According to hospital policy, patients must be isolated for at least 10 days from the date of their initial PCR test findings. The discharge requirements for asymptomatic patients were 10 days of isolation from the first positive PCR date, whereas symptomatic patients required 10 days plus 3 additional symptom-free days.<sup>29</sup> Nonetheless, several patients came to the hospital with positive PCR results from external laboratories days before admission. This explains why the LoS for some patients could become less than ten days.<sup>30</sup>

From a total of 132 patients, 104 patients (78.79%) were declared cured and allowed to go home, 4 patients (3.03%) went home for self-isolation, and 24 patients (18.18%) were referred. Among 132 patients, no patients died while being treated at Indrapura Field Hospital, Surabaya, and no patients went home at their request (forcibly discharged). These results are slightly different from the study conducted at Immanuel Hospital, Bandung, where the outcome data consisted of 12 deaths reported during treatment (25%), 31 patients were declared cured after performing PCR swabs twice in a row (64.5%), 3 patients (6.25%) were referred, and 2 patients (4.16%) went home of their own accord.<sup>19</sup>

## Strength and Limitations

The main limitation of this study was the small number of patients included. This study was also conducted in only one area. Therefore, it cannot fully represent the whole country. Despite the limitations, this study provided data focusing on an elderly group of COVID-19 patients to increase clinicians' awareness and knowledge of treating elderly patients with COVID-19. In the future, further study covering more areas and larger sample sizes is needed for better understanding.

## Conclusion

COVID-19 cases in the elderly group treated at Indrapura Field Hospital, Surabaya, were predominated by male patients, whose age range was 61 to 63. Most of them were private employees. The highest case of comorbidity was hypertension. Most patients treated in this hospital had mild symptoms. The common symptom experienced was a productive cough. None of the patients were given antiviral or antibiotic therapy. Instead, patients received SIRNO therapy, which provided excellent results, with most of them being discharged with cured outcomes.

## Acknowledgments

Special thanks to Indrapura Field Hospital Healthcare Team for their assistance in this study.

## Conflict of Interest

The authors declared there is no conflict of interest.

## Funding

This study did not receive any funding.

## Ethical Clearance

This study had received ethical clearance from the Faculty of Medicine, Universitas Airlangga, Surabaya, Indonesia, Ethics Committee (registration number: 67/EC/KEPK/FKUA/2022) on 30-03-2022.

## Authors' Contributions

Designed the study and drafted the manuscript: HM. Collected data and performed background literature review: HM. Performed statistical analysis: HM and EAT. Supervised results and discussion: HM, EAT, NIH, and LK. All authors reviewed and approved the final version of the manuscript.

## References

- Nalbandian A, Sehgal K, Gupta A, Madhavan MV, McGroder C, Stevens JS, et al. Post-Acute COVID-19 Syndrome. *Nat Med* 2021; 27: 601–615. [PubMed]
- Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, et al. Baseline Characteristics and Outcomes of 1591 Patients Infected with SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. *JAMA* 2020; 323: 1574–1581. [PubMed]
- Preston J, Biddell B. The Physiology of Ageing and How These Changes affect Older People. *Medicine (Baltimore)* 2021; 49: 1–5. [Journal]
- Li Z, Zhang Z, Ren Y, Wang Y, Fang J, Yue H, et al. Aging and Age-Related Diseases: From Mechanisms to Therapeutic Strategies. *Biogerontology* 2021; 22: 165–187. [Journal]
- Liu Z, Liang Q, Ren Y, Guo C, Ge X, Wang L, et al. Immunosenescence: Molecular Mechanisms and Diseases. *Signal Transduct Target Ther* 2023; 8: 200. [Journal]
- Bonafè M, Prattichizzo F, Giuliani A, Storci G, Sabbatinelli J, Olivieri F. Inflamm-Aging: Why Older Men are the Most Susceptible to SARS-CoV-2 Complicated Outcomes. *Cytokine Growth Factor Rev* 2020; 53: 33–37. [PubMed]
- Guan W, Ni Z, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med* 2020; 382: 1708–1720. [PubMed]
- Tizazu AM, Mengist HM, Demeke G. Aging, Inflammaging and Immunosenescence as Risk Factors of Severe COVID-19. *Immun Ageing* 2022; 19: 53. [Journal]
- Tufan ZK, Kayaaslan B, Mer M. COVID-19 and Sepsis. *Turkish J Med Sci* 2021; 51: 3301–3311. [Journal]
- Jannah SN, Arfijanto MV, Rusli M, Widodo ADW. Sepsis: Antibiotic Resistances of Gram-Positive and Gram-Negative Bacterial in a Tertiary Care Hospital. *JUXTA J Ilm Mhs Kedokt Univ Airlangga* 2021; 12: 29–37. [Journal]
- Hanif H, Wardhani IL, Widhiyanto L, Chilmi MZ. The Impact of COVID-19 Pandemic on the Epidemiology of Hip and Knee Arthroplasty: A Two-Year Look into the Pandemic from a Single Tertiary Referral General Hospital in Indonesia. *JUXTA J Ilm Mhs Kedokt Univ Airlangga* 2024; 15: 44–50. [Journal]
- Wahyuhadi J, Triyono EA, Waloejo CS, Harianto A, Jaya HP, Aulia FA, et al. Therapy for Patients with Asymptomatic and Mild Cases of COVID-19 in Indonesia. *F1000Research*; 10. 2021. [Journal]
- Mirbeyk M, Saghaizadeh A, Rezaei N. Geriatrics and COVID-19. *Adv Exp Med Biol* 2021; 1318: 209–222. [PubMed]
- Talari K, Goyal M. Retrospective Studies – Utility and Caveats. *J R Coll Physicians Edinb* 2020; 50: 398–402. [Journal]
- Gates B, Allen P. Excel. (2021). [Website]
- Nie NH, Bent DH, Hull CH. Statistical Package for the Social Sciences (SPSS), (2017). [Website]
- Koh J, Shah SU, Chua PEY, Gui H, Pang J. Epidemiological and Clinical Characteristics of Cases During the Early Phase of COVID-19 Pandemic: A Systematic Review and Meta-Analysis. *Frontiers in Medicine* 2020; 7: 295. [PubMed]
- Azwar MK, Setiati S, Rizka A, Fitriana I, Saldi SRF, Safitri ED. Clinical Profile of Elderly Patients with COVID-19 Hospitalised in Indonesia's National General Hospital. *Acta Med Indones* 2020; 52: 199–205. [PubMed]
- Widjaja JT, Kwee L, Giantara AK, Subagiyo HA, Edwin C, Putri RL. Karakteristik Pasien COVID-19 Rawat Inap di RS Immanuel Bandung, Indonesia. *J Med Heal*; 3. 17 August 2021. [Journal]
- Surya PA, Mustikaningtyas MH, Thirafi SZT, Pramitha AD, Mahdy LT, Munthe GM, et al. Occupational Safety and Health Risk Factors of Healthcare Workers during COVID-19 Pandemic. *Indones J Occup Saf Heal* 2021; 10: 144–152. [Journal]
- Fauzar F, Kurniati R, Abdullah F, Kam A. The Profile of COVID-19 Patients in Semen Padang Hospital Indonesia. *J Kesehat Andalas* 2021; 10: 45. [Journal]
- Triyono EA, Rehatta NM, Nabilah, Tan F. Clinical Profiles and IL-6 Level Analysis of Critical Covid-19 Patients Receiving Lopinavir-Ritonavir. *Folia Medica Indones* 2023; 59: 92–98. [Journal]
- Burhan E, Susanto AD, Nasution SA, Ginanjar E, Pitoyo CW, Susilo A, et al. Pedoman Tatalaksana COVID-19. 3rd ed. Jakarta: PDPI, PERKI, PAPDI, PERDATIN, IDAI, 2020. [Book]
- Prasetya HR, Triyono EA, Notopuro PB, Kartina L. The Outcome of Oxygen Therapy on Desaturated Patient with Moderate to Severe Symptoms in Kogabwilhan II Indrapura Field Hospital. *Intisari Sains Medis* 2023; 14: 953–955. [Journal]
- Liu K, Chen Y, Lin R, Han K. Clinical Features of COVID-19 in Elderly Patients: A Comparison with Young and Middle-Aged Patients. *J Infect* 2020; 80: e14–e18. [PubMed]
- Siswanto JLJ, Kalanjati VP, Soetjipto S, Yasin AMM. Anosmia, Dysgeusia, and Comorbidity in COVID-19 Patients with Respiratory Tract Manifestations. *J Respirasi* 2023; 9: 188–193. [Journal]
- Anam MS, Wistiani W, Sahyuni R, Hapsari MMDEAH. Profil Klinis, Laboratorium, Radiologis dan Luaran Pasien COVID-19 pada Anak di RSUP Dr. Kariadi Semarang. *Medica Hosp J Clin Med* 2020; 7: 130–136. [Journal]
- Octavia U, Chozin I, Sugiri Y. Value of Neutrophil-Lymphocyte Ratio (NLR), Monocyte-Lymphocyte Ratio (MLR), Absolute Lymphocyte Count (ALC) and Procalcitonin in Patients in COVID-19 Monitoring (PDP) at Dr. Saiful Anwar Malang Hospital. *J Respirologi Indones*; 40. 31 July 2020. [ResearchGate]
- Triyono EA, Seipalla F, Djaja N, Akbas AMI, Ar-Rahmah KA, Budiono PS, et al. Clinical Characteristics of Patients with COVID-19 Admitted to the COVID-19 Emergency Field Hospital of Bangkalan, Indonesia. *F1000Research* 2022; 11: 414. [PubMed]
- Christanto A, Listyoko A, Putra N. Analysis of Comorbidity and Its Association with Disease Severity and Mortality Rate in Hospitalized COVID-19 Patients. *J Respirologi Indones* 2022; 42: 19–27. [Journal]