

Analysis Impact of COVID-19 Pandemic on Veterinary Practice Services in Bandung

Dianita Gustina¹, Noormarina Indraswari², Tyagita Hartady^{1,3*}

¹Study Program of Veterinary Medicine, Faculty of Medicine, Universitas Padjadjaran, Jatinangor, Indonesia

²Department of Public Health, Faculty of Medicine, Universitas Padjadjaran, Jatinangor, Indonesia

³Department of Biomedical Sciences, Faculty of Medicine, Universitas Padjadjaran, Jatinangor, Indonesia

*Penulis untuk korespondensi: tyagita@unpad.ac.id

Diterima 13 Juni 2023, Disetujui: 19 Februari 2024

ABSTRACT

The increase in COVID-19 cases in Bandung has led to changes in health services, including animal health services. This study aimed to determine the impact of the COVID-19 pandemic and the efforts made by veterinarians to overcome the impact of the COVID-19 pandemic in the clinic. Data was collected by collecting primary data through in-depth interviews. Data was collected on selected respondents to obtain data and explore the impact and efforts made during the pandemic on each veterinary practice service. The impacts found included a shortage of medicines and medical equipment, staff infected COVID-19, temporary closure of veterinary clinics, reduced number of patients, and a shortage of medical staffs. Meanwhile, the efforts include implementing health protocols, changing operational schedules, modifying service flows, providing online or telemedicine services, limiting surgical procedures, providing medicines and medical equipment in the long term, and increasing the number of examination rooms.

Keywords: COVID-19 impact, COVID-19 pandemic, health services, veterinarian, veterinary clinic

ABSTRAK

Kenaikan jumlah kasus COVID-19 di Bandung telah menyebabkan perubahan dalam layanan kesehatan, termasuk layanan kesehatan hewan. Studi ini bertujuan untuk menentukan dampak pandemi COVID-19 dan upaya yang dilakukan oleh dokter hewan untuk mengatasi dampak pandemi COVID-19 di klinik. Data yang digunakan adalah data primer melalui wawancara mendalam. Pengumpulan data dilakukan pada informan terpilih untuk mendapatkan jawaban, mengeksplorasi dampak dan upaya yang dilakukan selama pandemi pada setiap layanan praktek dokter hewan. Dampak yang ditemukan termasuk kekurangan obat-obatan dan peralatan medis, staf terinfeksi COVID-19, penutupan sementara klinik hewan, penurunan jumlah pasien, dan kekurangan staf medis. Sementara itu, upaya yang dilakukan termasuk menerapkan protokol kesehatan, mengubah jadwal operasional, modifikasi alur layanan, menyediakan layanan online atau telemedicine, pembatasan prosedur bedah, penyediaan obat dan peralatan medis dalam jangka panjang, dan peningkatan jumlah ruang pemeriksaan.

Kata Kunci: dampak COVID-19, dokter hewan, klinik hewan, pandemi COVID-19, pelayanan kesehatan

INTRODUCTION

Corona Virus Disease 2019 (COVID-19) has spread to Indonesia since early 2020 and now has been designated by the World Health Organization (WHO) as a pandemic. COVID-19 infection can cause disease symptoms ranging from mild to severe and even lead to death (Yusuf & Usman, 2021). The virus is generally transferred via droplets of saliva or exudate from an infected person's nose (sneezing or coughing) and by contact an infected person's hands or face (Paramitra & Putra, 2020).

The spread of COVID-19 in Bandung is fast. Based on the latest data obtained from the site of the COVID-19 Information Center (Pusicov) on 2 January 2022, it was reported that there were 43,549 confirmed cases, indicating a large number of COVID-19 cases in Bandung. The COVID-19 pandemic has had a significant impact on a variety of disciplines, including the health sectors, particularly in health services (Pemerintah Indonesia, 2021; Nisa, 2021).

During the COVID-19 pandemic, the supply of medicines at community health centres (Puskesmas) was inadequate. The medications delivered to the community health centres were insufficient compared to the demand, resulting in drug scarcity (Forrester, 2020; Gurning *et al.*, 2021). In addition, some medical staff were confirmed to be infected with COVID-19. It is because all medical staff meet different people who could be infected with COVID-19 (Liasari, 2020). During the early days of the COVID-19 pandemic, visitors to various health facilities decreased. It is assumed because of the public's apprehension of accessing health facilities during the pandemic was started (Hamzah, 2020).

Changes in animal health services have also resulted from the COVID-19 pandemic, one of which is under the jurisdiction of the West Kalimantan Provincial Government. According to Wahyudi (2020), these changes include the implementation of health protocols. Only one owner was allowed to accompany the animal during the examination. An online queuing system was implemented to control the number of patient services to avoid crowding. The veterinary clinic also has a sink for sanitation and hygiene and posters to socialize awareness of the COVID-19 health protocol.

The impact of the COVID-19 pandemic on animal health services in West Kalimantan has piqued experts' interest, prompting them to perform additional in-depth research in Bandung. It's backed up by the lack of reports or more in-depth studies on COVID-19's impact on Bandung's animal health services. Changes

in health services, particularly animal health care, have resulted from a peak of COVID-19 cases in the city of Bandung. Therefore, this study aimed to determine the impact of the COVID-19 pandemic and the efforts made by veterinarians to overcome the impact of the COVID-19 pandemic in the clinic.

MATERIALS AND METHODS

Ten in-depth interviews were conducted with veterinarians and clinic staffs from February 2022 to March 2022. Each interview lasted 30 minutes, was recorded using a digital recorder and conducted in Bahasa Indonesia (Sugiyono, 2020).

Participant Selection

Veterinarians, paramedics, and veterinary clinic administrative staffs in Bandung who (1) worked before the COVID-19 pandemic, (2) worked in veterinary clinics that provide surgery, and (3) agreed to be an respondents in this study are eligible to participate. In this study, the respondents were chosen using sampling, which involves pre-selecting respondents depending on the researcher's criteria (Martha & Kresno, 2020).

Analysis and Findings

The transcripts were evaluated using thematic analysis. D.G. independently coded the transcripts to include diverse views in the study and improve the coding structure. The theme was developed in an inductive descriptive manner from the data through rigorous analysis and comparison of interviews. In March 2022, the summary of the initial finding was presented to study participants to see if their responses were interpreted accurately, improve the emerging analytical framework, and see if the report made sense to people with multiple perspectives (Martha & Kresno, 2020).

RESULT

Table 1 shows the characteristics of the respondents in this study. Ten respondents, consisting of five veterinarians, three paramedics, and two administrative staff in Bandung, were involved in this study. Two themes emerged from the interviews: The impact of the pandemic on veterinary clinics and the attempts of the veterinary clinics to overcome the impact of the pandemic.

Table 1. Demographic Characteristics of respondents

Age (years)	Gender	Occupation
34	Male	Veterinarian
45	Female	Veterinarian
56	Female	Veterinarian
32	Female	Veterinarian
26	Male	Veterinarian
23	Female	Paramedic
26	Female	Paramedic
33	Male	Paramedic
40	Female	Administrative Staff
24	Female	Administrative Staff

Impact of the COVID-19 Pandemic on Veterinary Clinics in Bandung

The emergence of COVID-19 caused several significant impacts on people's quality of life in various physical, psychological, and environmental aspects (Banarjee et al., 2020). One of the direct impacts of this pandemic is on health. Veterinary clinics as health facilities have also been affected by the COVID-19 pandemic.

Shortage of Medicines and Medical Equipment

Several clinics informed that vaccines for animals were limited during the pandemic. The vaccine was difficult to obtain during the second wave of COVID-19, where COVID-19 cases were high in Indonesia.

"Oh yes, from 2021 to the middle, before the second wave, starting with medicines, especially vaccines, was empty." #1

Difficulties in obtaining respiratory drugs and anaesthetic drugs also occurred in veterinary clinics. Veterinary clinics struggled to obtain these medications during the COVID-19 outbreak.

"There were many obstacles, such as the supply of anaesthetic drugs." #2

"Of course, during this pandemic, respiratory treatments were restricted." #4

Apart from medicines, the increase in COVID-19 patients necessitates the use of intravenous fluids and the inability to obtain the oxygen. This limitation occurs when there is a delta variant of COVID-19.

"When the delta variant was high and needed more oxygen, there was a shortage of oxygen." #5

"In 2020-2021, the medicines stock was also a problem for us. Intravenous medication, for example, have proven to be challenging." #1

Infected Clinic Staff by COVID-19

During the COVID-19 pandemic, there was a transmission of COVID-19 at veterinary clinics, resulting in the infection of numerous clinic staffs. This infection occurred in the middle of last year, and almost half of the staffs at the clinic were infected.

"Almost half of us were infected at the clinic, if I am not mistaken." #4

"Many staffs here were infected in the middle of last year. I also got infected to Covid-19." #8

Veterinary Clinic Temporary Closure

The temporary closure was carried out when there were infected staffs. This closure aims to disinfect the room and all equipment in the clinic, such as chairs, doorknobs, tables, and other objects, for 2-3 days.

"For example, almost half of us were infected, and we closed the clinic first and disinfected and sterilized all the rooms and equipment." #1

"We closed the clinic closed here because someone was infected, so the service was off to do sterilization for 2-3 days." #5

Decrease Number of Patients in the Early Period of the COVID-19 Pandemic

During the early days of the COVID-19 pandemic, there was a change in the number of patients at several clinics. The number of patients decreased during the pandemic compared to before the pandemic.

"If evaluated during the initial pandemic, there has been a change, including a decrease in the number of patients." #2

"We had decreased the number of patients at the beginning of the pandemic." #3

Lack of Medical Staffs

When the staff were infected with COVID-19, there was a shortage of medical staff at the veterinary clinic. There was a veterinary clinic with only one veterinarian remaining. Hence, it was not easy to provide the health services.

“We once had only one vet because the others were infected, and it was quite difficult to serve all patients with only one veterinarian.” #1

Efforts of Veterinary Clinics in Bandung to Overcome the Impact of COVID-19 Pandemic

Following the discovery of the COVID-19 pandemic's impact on veterinary clinics in Bandung, veterinary clinics must take various steps to ensure that the pandemic's negative impact does not impede the clinic's service process. Efforts made by clinics must also comply with government regulations that apply during the pandemic.

Implementation of Health Protocol

A veterinary clinic is a place where veterinary medical services are provided to a large number of individuals. The activity was held indoors to ensure that health regulations are followed at the veterinary clinic as part of the efforts to prevent the transmission of COVID-19.

“The protocol itself started at the front. There was a handwashing area with soap, then to maintain a safe distance, the client must wear a mask, and only one person is permitted to enter the clinic.” #3

Operational Schedule Changes

Several veterinary clinics were closed down temporarily during the beginning of the COVID-19 pandemic due to concerns about COVID-19 transmission. However, the clinic has begun to reopen by putting operational schedule limitations.

“At the beginning of the pandemic, we had got a rest for two weeks. We did not serve patients because we were worried about COVID-19 transmission. But after that, we started to try to reopen with a shorter schedule. As example the normal operational hours is 8 AM – 5 PM, but during COVID-19 pandemic the operational hours is 10 AM – 4 PM.” #8

Service Flow Changes

Veterinary clinics in Bandung had started implementing an online registration or reservation system and limiting the number of clients in the waiting room. Then, if clients visited the clinic and were accompanied by several companions, only one person could enter.

“Those who came early in the pandemic had to make a reservation first, and then they were given a schedule of when they should arrive. As a result, the client who arrived was on time.” #2

“There are a maximum of 2 individuals in the examination room and 4-5 people in the waiting room.” #7

“It's enough for one person to come in here; the rest of the companions will have to wait outside.” #10

Providing Telemedicine Services

Under the guidance of the Indonesian Veterinary Association, the clinic began providing online services (telemedicine) to the Indonesian Veterinary Medical Association (*Perhimpunan Dokter Hewan Indonesia / PDHI*). There is no specific regulation governing telemedicine services for veterinarians in Indonesia. However, there is a general regulation, namely the regulation of the Minister of Health of the Republic of Indonesia number 20 of 2019 concerning the Implementation of Telemedicine Services between Health Service Facilities. Telemedicine strives to reduce the number of times patients have to travel.

“Since the pandemic, more people have sought advice online because they needed to be online throughout the crisis; thus, they did not travel as much” #3

“We made an effort to connect to the internet, specifically in early January 2021, following the instructions provided by PDHI.” #5

Surgical Procedure Limitation

During the pandemic, the clinic divides surgery into segmented scheduled and emergency categories. Emergency surgery was always available, but scheduled surgery only accepted an orchietomy. Following that, the clinic began to take ovariohysterectomy cases but did not accept surgery on large breed dogs due to a lack of anaesthetic medicines.

“When cases were rising last year, and some of us were infected, we only did emergency surgery. After that, we began to obtain castration surgery because it was a fast process. For ovariohysterectomy, you must proceed an appointment.” #4

“Anesthetics were limited at the time. To save even more anaesthesia, we do not take large dogs.” #1

Long-Term Supply of Medicine and Medical Equipment

Veterinary clinics must pay more attention to supplies when there is a shortage of medicines and medicinal equipment. Several veterinary clinics began providing medicines and medical equipment for the next 2-3 months during the COVID-19 pandemic, and they always pay attention on the drug stocks that were decreasing.

“The steps we take here are to always stock up on medications every 2-3 months. Every less than five stocks will be reported to the admin immediately; do not let it run out because it is for clinic operations.” #2

Increase The Number of Examination Rooms

During the pandemic, two veterinary clinics have begun to increase the number of examination rooms. The increased number of rooms was expected to speed up the services at the veterinary clinic. The faster a service is delivered, the lower the risk of COVID-19 transmission in the clinic.

“To avoid crowding inside, we now employ two examination rooms. We also planned to open three rooms, but they are under processed.” #1

“Since the pandemic, there have been two examination rooms.” #2

DISCUSSION

Due to the increased demand for pharmaceuticals used by hospitals as sedatives and supportive treatments for COVID-19 patients, veterinary clinics encountered a shortage of medicines such as anaesthetics, respiratory drugs, and intravenous fluids during the COVID-19 pandemic (Ahmed & Hassan, 2020; Al-Sumiadai *et al.*, 2020; Cazzola *et al.*, 2020). Additionally, during the pandemic, veterinary clinics were experiencing a vaccine scarcity. Researchers, on the other hand, found no evidence of a link between vaccines and the pandemic. One of the medications in high demand to deal with the rise of COVID-19 patients was oxygen (Yulianti *et al.*, 2022). As a result of the increased demand for oxygen, several hospitals and veterinary clinics were having trouble procuring

enough. This problem arose because the oxygen distribution network was inefficient (Rokom, 2021).

The infection of clinical staffs by COVID-19 is one of the impacts of the COVID-19 pandemic. Meeting staffs with clients and possibly spreading COVID-19 trigger a disease transmission (Liasari, 2020). Most of these transmissions occurred in June 2021. In that month, there was a significant increase in COVID-19 cases in Bandung, which had increased by more than two times since the preceding wave, according to the data (Pemerintah Indonesia, 2021). When transmission occurred at the clinic, a temporary closure was done to disinfect the room. The closing activity was held following Minister of Health Regulation Number HK.01.07/MENKES/328/2020,¹⁸ which outlines criteria for avoiding and controlling COVID-19 in office and industrial workplaces to ensure business continuity in the event of a pandemic (Peraturan Menteri Kesehatan, 2020).

The staffs shortage in veterinary clinics also occurred during the COVID-19 pandemic. Staffs had to self-isolate when infected with COVID-19 until the diagnosis results returned negative. Self-isolation aims to reduce the rate of spread and transmission of COVID-19 and comply with the Minister of Health Regulation Number HK.01.07/MENKES/328/2020 (Peraturan Menteri Kesehatan, 2020). There was also a decrease in patients at the beginning of the pandemic. This decrease can occur due to the implementation of considerable periodic social restrictions (PSBB). With these restrictions, some people preferred to stay at home and increased public anxiety over leaving the house (Hamzah, 2020; Labib, 2020).

Following the discovery of the COVID-19 pandemic's impact on veterinary clinics in Bandung, veterinary clinics must take several steps to ensure that the pandemic's negative impact does not impede the service process. The clinic has started implementing health protocols to prevent the spread of COVID-19 transmission. Everyone must implement the health protocol, which consists of wearing a mask, washing hands with soap, maintaining physical distance from others, avoiding crowds, and reducing mobility (Sari, 2021). Based on the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/Menkes/382/2020, the health protocol must be applied during the COVID-19 pandemic in every activity, indoors and outdoors (Peraturan Menteri Kesehatan, 2020).

During the COVID-19 pandemic, the veterinary clinic's operational hours were altered. Clinics must observe the applicable rules outlined in the Instruction of Minister of Home Affairs No. 27 of 2021 (Instruksi Menteri Dalam Negeri, 2021). During

the Enforcement of Community Activity Restrictions (*Pemberlakuan Pembatasan Kegiatan Masyarakat / PPKM*), the regulation limits community activities, including restricting operational schedules in various commercial locations. Although veterinary clinics were considered significant places and permitted to operate at total capacity, five veterinary clinics limit their operational hours following the PPKM requirements for other businesses.

The flow of services at the clinic during the COVID-19 pandemic also underwent several changes. The clinic began taking online reservations and limiting the amount clients could enter the waiting room. These restrictions were under regulations stipulated by the Regulation of the Minister of Health Number HK.01.07/MENKES/328/2020, regarding PPKM in the essential sector, which were allowed to operate during the PPKM period but with a maximum capacity of 50% (Peraturan Menteri Kesehatan, 2020). These changes were intended to make veterinary clinics prioritize to the safety of their staff and clients to avoid the transmission of COVID-19.

The provision of telemedicine services at clinics is a form of government responsibility in providing health services during the COVID-19 pandemic, which was stated in the Decree of the Minister of Health of the Republic of Indonesia Number HK.01.07/MENKES/4829/2021 (Peraturan Menteri Kesehatan, 2020). Telemedicine was accessible only to patients who have already visited the clinic and required continuous consultation. New patients were not eligible for telemedicine and will be advised to seek direct consultation at the clinic. The telemedicine service aims to minimize the possibility of virus transmission in health facilities and provide protection for the healthy staffs (Widhiarso, 2021).

Clinics only accepted scheduled procedures and orchiectomies on small animals during the pandemic. Following that, the clinic began to take ovariohysterectomy cases but did not accept surgery on large breed dogs to save expenses on anaesthetic drugs. Instead, clients with large breed pets were referred to another veterinary clinic for surgical procedures. The clinic also has a long-term supply of medications on hand and monitors the availability of limited drugs. The clinic rooms were also added to speed up the service delivery at the veterinary clinic, particularly the time used by clients while queuing. Faster service can minimize the spread of COVID-19 in clinics by reducing crowding (Oginawati *et al.*, 2022).

In conclusion, the COVID-19 pandemic impacted the scarcity of medicines and medical devices, COVID-19 infections in clinical staffs, temporary closure of veterinary clinics, a decrease in the number of patients,

and a shortage of medical personnel. Meanwhile, clinics were trying to overcome the impacts, including changes in operational schedules, service flow, online or telemedicine service, online service procedures, long-term supply of medicines and medical devices, and increasing the frequency of rooms inspection.

ACKNOWLEDGMENT

The author declares that no significant competing financial, professional, or personal interest might have affected the performance or presentation of the work described in this manuscript. The authors would like to acknowledge the veterinarians and staffs in the veterinary clinic for their contributions to this study. Thank you to all those who have helped the author contributed to complete this study.

REFERENCES

- Ahmed MH & Hassan A. 2020. Dexamethasone for the Treatment of Coronavirus Disease (COVID-19): a Review. *S.N. Comprehensive Clinical Medicine* 2(12): 2637–2646. Available from: <https://doi.org/10.1007/s42399-020-00610-8>
- Al-Sumiadai MM, Ghazzay H, Zabin W, & Al-Dulaimy S. 2020. Therapeutic effect of Vitamin A on severe COVID-19 patients. *EurAsian Journal of BioSciences Eurasia J Biosci* 14: 7347–7350. Available from: <https://www.medscape.com/viewarticle/924596>.
- Banarjee D, Vaishnav M, Rao ST, Raju M, Dalal P, Javed A, Saha G, Mishra KK, Kumar V, & Jagiwal MP. 2020. Impact of the COVID-19 Pandemic on Psychosocial Health and Well-Being in South-Asian (World Psychiatric Association zone 16) Countries: A Systematic and Advocacy Review from the Indian Psychiatric Society. *Indian Journal of Psychiatry* 62: 343–353. Available from: <https://doi.org/10.4103/psychiatry.IndianJPsychiatry>
- Cazzola M, Ora J, Bianco A, Rogliani P, & Matera MG. 2020. Management of COPD patients during COVID: difficulties and experiences. *Expert Review of Respiratory Medicine* 15(8): 1025–1033. Available from: <https://doi.org/10.1080/17476348.2021.1929176>
- Forrester. 2020. Precaution for operating room members during the COVID-19 pandemic. *J Am Col Surg* 230(6)
- Gurning FP, Siregar SF, Siregar UR, Rusmayanti, R, and Nurhasanah F. 2021. Analisis manajemen pengelolaan obat pada masa pandemi di Puskesmas Sering Kecamatan Medan Tembung. *Jurnal Kesehatan Masyarakat (e-Journal)* 9(5).

- Available from: <http://ejournal3.undip.ac.id/index.php/jkm>
- Hamzah AA. 2020. Covid-19, Apa yang seharusnya diketahui Oleh Pemerintah Daerah 1: 7–8.
- Instruksi Menteri Dalam Negeri No 27 Tahun 2021 Tentang Pemberlakuan Pembatasan Kegiatan Masyarakat Level 4, Level 3, dan Level 2 Corona Virus Disease 2019 di Wilayah Jawa dan Bali
- Labib A. 2020. Implementasi Literasi Kesehatan Terkait Covid-19 Di Kampung Tangguh Semeru 1000 Masker Kelurahan Jrebeng Kidul Kota Probolinggo. [Thesis]. University of Airlangga. Available from: <http://repository.unair.ac.id/104404/>
- Liasari I. 2020. Studi Literatur: Pencegahan Penyebaran Sars-Cov-2 Pada Praktik Kedokteran Gigi. *Media Kesehatan Gigi: Politeknik Kesehatan Makassar* 19(1): 41–46. Available from: <https://doi.org/10.32382/mkg.v19i1.1598>
- Martha E & Kresno S. 2020. Metodologi Penelitian Kualitatif Untuk Bidang Kesehatan. Rajawali Pers
- Nisa IS. 2021. Dampak Covid-19 dalam bidang kesehatan. Available at: <http://ners.unair.ac.id/site/index.php/news-fkp-unair/30-lihat/1181-dampak-covid-19-dalam-bidang-kesehatan>
- Oginawati K, Nathanael RJ, Pasaribu US, Mukhaiyar U, Humam A, Ilmi NFF. 2022. Analysis of the Effect and Role of Indoor Environmental Quality in the COVID-19 Transmission. *Aerosol Air Qual Res* 22(5): 1–12. Available from: <https://aaqr.org/articles/aaqr-21-11-covid2-0339>
- Paramita IBG, Putra IGGPA. 2020. New Normal Bagi Pariwisata Bali Di Masa Pandemi Covid-19. *J Ilm Pariwisata Agama dan Budaya* EISSN 2614:ISSN 2527-9734. Available from: doi: <http://ejournal.ihdn.ac.id/index.php/PB/index>
- Pemerintah Indonesian. 2021. Corona Virus Disease 2019 (COVID-19). Available from: <https://covid19.go.id/>
- Peraturan Menteri Kesehatan Nomor HK.01.07/MENKES/328/2020 tentang Panduan Pencegahan Dan Pengendalian Corona Virus Disease 2019 (Covid-19) Di Tempat Kerja Perkantoran Dan Industri Dalam Mendukung Keberlangsungan Usaha Pada Situasi Pandemi
- Rokom. 2021. Penuhi Kebutuhan Oksigen, Pemerintah Konversikan 90% Oksigen Industri ke Medis. Available from: <https://sehatnegeriku.kemkes.go.id/baca/umum/20210705/3238042/penuhi-kebutuhan-oksigen-pemerintah-konversikan-90-oksigen-industri-ke-medis>
- Sari RK. 2021. Identifikasi Penyebab Ketidapatuhan Warga Terhadap Penerapan Protokol Kesehatan 3M Di Masa Pandemi Covid-19. *J AKRAB JUARA* 6(1): 84–94. Available from: <https://akrabjuara.com/index.php/akrabjuara/article/view/1354>
- Sugiyono. 2020. Metode Penelitian kuantitatif dan R&D. PT Alfabeta
- Wahyudi B. 2020. Pelayanan kesehatan hewan di masa pandemi. UPT Keswan Kalbar. Available from: <https://uftpelkeswan-kalbar.com/pelayanan-kesehatan-hewan-di-masa-pandemi>
- Widhiarso A. 2021. Tantangan dan Perkembangan Di Masa Pandemi Covid-19. *J Farm dan Kesehatan Indonesia* 1(3) :46-54. Available from: journal.ukrim.ac.id/index.php/jfki
- Yulianti NEW, Budhiarta INP, & Suryani LP. 2022. Perlindungan Hukum terhadap Konsumen Tabung Oksigen Hasil Modifikasi di Masa Pandemi Covid-19 Berdasarkan Undang- Undang Nomor 8 Tahun 1999 Tentang Perlindungan Konsumen. *Jurnal Interpretasi Hukum* 3(1): 107–112. Available from: <https://doi.org/10.22225/juinhum.3.1.4647.107-112>
- Yusuf S & Usman. 2021. Optimisme Menghadapi Tantangan Pandemi COVID-19. P.T. Nasya Expanding Management