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ANALYSIS OF PUBLIC SAFETY CENTER 119 AMBULANCE SERVICES USING LEAN SIX SIGMA

Analisis Pelayanan Ambulans Public Safety Center *119 Menggunakan Pendekatan Lean Six Sigma*

Thasya Sabilla Putri Rojak[1], Masyitoh Basabih[1], Winarto[2], Roy Michael Suranta[2]
[1]Faculty of Public Health, University of Indonesia, Depok, Indonesia
[2]DKI Jakarta Health Service Emergency Ambulance, South Jakarta, Indonesia
Correspondence*:
Address: FKMUI Jl. Lingkar Kampus Raya, Depok, Indonesia | e-mail: thasyaas16@gmail.com

Abstract

Background: DKI Jakarta reports approximately 5,000 annual deaths due to heart disease, disasters, accidents, and other causes. Ambulance demand has risen, especially for COVID-19 cases requiring rapid medical attention. In 2022, the average emergency response time ranged from 21 to 30 minutes. Therefore, efforts are needed to improve the response time of PSC 119 ambulances to minimize impacts.
Aims: This study uses the Lean Six Sigma methodology to analyze the factors contributing to prolonged response times in emergency ambulance services.
Methods: This study used a mixed-method approach based on the DMAI (define, measure, analyze, and improve). The data were collected through observations, document reviews, and in-depth interviews.
Results: The results showed that the average duration of ambulance services was 4 hours and 30 minutes. The identified inefficiencies include software issues with the Nusantara app, staff fatigue, and license renewals, difficult access for ambulance and URC units, delays from call center staff awaiting family decisions, closely located posts leading to fewer cases per post, community-initiated patient movements, challenges in finding suitable referral hospitals for special cases, and slow response times from referral hospitals.
Conclusion: The recommended improvements include using a kaizen board, conducting expert training, promoting the Integrated Referral System or *Sistem Informasi Rujukan Terintegrasi* (SISRUTE), and revising standard operating procedures.

Keywords: ambulance services, Public Safety Center 119, Lean Six Sigma

Abstrak

Latar Belakang: *DKI Jakarta melaporkan sekitar 5.000 kematian per tahun akibat penyakit jantung, bencana, kecelakaan, dan penyebab lainnya. Permintaan ambulans meningkat, terutama untuk kasus Covid-19 yang membutuhkan penanganan medis cepat. Pada tahun 2022, rata-rata waktu tanggap darurat adalah 21–30 menit. Oleh karena itu, diperlukan upaya untuk meningkatkan waktu tanggap ambulans PSC 119 guna meminimalkan dampak.*
Tujuan: *Penelitian bertujuan untuk menganalisis penyebab lamanya waktu yang dibutuhkan pasien dalam proses gawat darurat menggunakan ambulans dengan menggunakan metode Lean Six Sigma.*
Metode: *Penelitian ini merupakan penelitian analisis kuantitatif dan kualitatif berdasarkan DMAI (define, measure, analyze, dan improve) dengan melakukan observasi, telaah dokumen, dan wawancara mandalam.*
Hasil: *Penelitian menunjukkan bahwa rata-rata durasi layanan ambulans adalah 4 jam 30 menit. Inefisiensi yang teridentifikasi meliputi masalah perangkat lunak pada aplikasi Nusantara, kelelahan staf dan perpanjangan izin, akses yang sulit ke unit ambulans dan URC, keterlambatan staf pusat panggilan yang menunggu keputusan keluarga, lokasi posko yang berdekatan sehingga jumlah kasus per pos lebih sedikit, perpindahan pasien yang diinisiasi oleh masyarakat, tantangan dalam menemukan rumah sakit rujukan yang sesuai untuk kasus khusus, dan waktu respons yang lambat dari rumah sakit rujukan.*
Kesimpulan: *Usulan perbaikan yang dapat diberikan yaitu menggunakan kaizen board, memberikan pelatihan dan serta pendidikan bagi petugas terkait, mengadakan sosialisasi mengenai Sistem Informasi Rujukan Terintegrasi (SISRUTE), serta meninjau kembali instruksi kerja yang telah dibuat.*

Kata kunci*: layanan ambulans,* Lean Six Sigma, Public Safety Center 119

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Introduction

Emergency medical service (EMS) is a modern system that focuses on pre-hospital care, involving immediate examination and treatment of emergency conditions before transporting patients to the hospital. Prehospital care is provided by EMS responders, who are the first healthcare providers in crisis locations (Hanfling et al., 2012). In Indonesia, the effectiveness of EMS can be assessed by examining its implementation in Jakarta. Emergency Medical Services in Indonesia began to develop in 2016 with the issuance of Ministry of Health Regulation Number 19 of 2016, which established the Integrated Emergency Response System or *Sistem Penanggulangangan Gangguan Terpadu* (SPGDT). SPGDT is a multi-sectoral, integrated emergency patient service mechanism based on the Public Safety Center (PSC), utilizing the telecommunications access code 119 for its call center and involving community participation. This regulation is expected to improve the prehospital emergency care system in Indonesia. The Integrated Emergency Management System or SPGDT operates through the National Command Center at the Ministry of Health and the Public Safety Center (PSC) 119 in each city or regency in Indonesia. This system ensures the safety and well-being of patients in crisis situations.

PSC 119 is a service in Indonesia that handles emergency cases promptly and carefully before patients are referred to the hospital. It is available through the call center application system namely 119. The integrated emergency response system is expected to improve public access to quality and prompt emergency services, with a standard maximum response time of 30 minutes from the initial call to the call center operator at 119. However, implementing PSC 119 without meeting emergency service standards will result in suboptimal handling of emergency patients, leading to increased disability, morbidity, and mortality rates (Prihanti, Widjanarko and Budiyono, 2022). The implementation of the Public Safety Center (PSC) 119 in various districts and cities in Indonesia, including Bitung City, has not met the established standards for emergency medical services. The PSC 119 in Bitung City encounters several challenges, primarily due to ineffective policy implementation and a lack of supportive factors. Additionally, the facilities and infrastructure for PSC 119 fail to meet emergency medical service standards. There is also a shortage of nursing resources for emergency care, compounded by limited funding that hampers the effective operation of PSC 119 in Bitung City. These challenges affect the overall implementation of PSC 119, including response time.

To enhance response time, a method that can streamline activities in the implementation of PSC 119 is essential. The most suitable approach for this purpose is the application of Lean Six Sigma. Lean is defined as a management philosophy aimed at improving productivity, quality, and lead time in both industrial and service operations (Parker, Scott and Geddes, 2020). Six Sigma is a structured business strategy that employ the DMAIC stages (define, measure, analyze, improve, and control) to assess, analyze, and enhance performance related to system operations. The application of Lean Six Sigma in healthcare facilitates efficient outcome, such as reducing patient hospital stays and improving clinical results, as the primary objective of this method is to optimize processes and minimize variability (Bertolaccini, Viti and Terzi, 2015).

Several studies have discussed the application of the Lean Six Sigma method in emergency services. One such study of Patient Flow Using Lean Six Sigma Approach in the Emergency Department of Hermina Depok Hospital by Siti Masfupah, addresses problem identification from the moment patients arrive in the emergency department until the handover by nurses in the treatment room, utilizing the Lean Six Sigma methodology (Masfupah, 2018). Another study, titled The Use of Lean Six Sigma for Improving Availability of and Access to Emergency Department Services by Ailish Daly, Seán Paul Teeling, Marie Ward, Martin McNamara, and Ciara Robinson, focuses on enhancing data

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management processes and patient flow in the emergency department through Lean Six Sigma techniques. This study examines patient flow from the time a patient arrives in the emergency department until they are admitted to a ward (Daly et al., 2021). However, none of these studies have addressed emergency services for PSC 119 ambulances using Lean Six Sigma. This study aims to enhance the effectiveness of ambulance services at the 119 by investigating the factors contributing to prolonged response times using the Lean Six Sigma method.

Method

This study was conducted from May 2023 to July 2023 at the Emergency Ambulance Service Unit of the DKI Jakarta Health Agency located at Jalan Kesehatan No. 10, Petojo Selatan, Gambir, Central Jakarta, DKI Jakarta. This study used a mixed method, combining qualitative and quantitative method. Qualitative research was used to examine the process and evaluate various aspects using in-depth interviews and direct observation techniques. Meanwhile, quantitative data were collected through a review of documents related to ambulance service activities provided by the Emergency Ambulance Service Unit of the DKI Jakarta Health Agency. Secondary data processing was performed using Microsoft Excel obtained from the Nusantara application. The data were manually checked for completeness and errors, including time format.

Key informants were selected using the snowball sampling method. This approach begins with a small group of initial participants who meet the research criteria. These participants subsequently refer others who also meet the criteria, thereby creating a "snowball" effect (Parker, Scott and Geddes, 2020). Data collection methods included in-depth interviews, observations, and document reviews. The 11 informants in this study were the Head of the Emergency Ambulance Service Unit of the DKI Jakarta Health Agency, regional service coordinators from East Jakarta, West Jakarta, Central Jakarta, South Jakarta, Thousand Islands, and North Jakarta, provincial service providers, call centre coordinators, drivers, and doctors.

In-depth interviews explored the timeline of ambulance services, including activities from pre-dispatch (before the ambulance is called) to the patient's arrival at the healthcare facility. Additionally, data collection was carried out through observations and document reviews by examining relevant guidelines, laws, and other files. This review aimed to obtain data on call processing times, ambulance team preparation times, ambulance response times, patient observation times, and patient transfer to the emergency. A Focus Group Discussion (FGDs) was held to discuss improvement proposals by 11 informants through an online meeting.

Validity and reliability tests were conducted with an ethical review to obtain a recommendation letter from the Ethics Review Team at the Faculty of Public Health, University of Indonesia. Researchers submitted the ethical review for a study titled "Analysis of Ambulance Service Time in the Public Safety Center 119 Program in 2022 Using the Lean Six Sigma Approach." Ket439/UN2.F10.D11/ PPM.00.02/2023, was issued on June 12, 2023.

Results and Discussion

Ambulance Service Process Flow

The ambulance service process flow was analyzed in the first stage of the Lean Six Sigma methodology, specially the define stage. The define phase is the stage where problems are identified through process mapping (Masfupah, 2018). This stage involved identifying problems in the ambulance service process through a flowchart derived on in-depth interviews and observations. Several obstacles were found at each stage of the ambulance service, as summarized in the table of constraints (Tabel 1).

The constraints were categorized according to the ambulance service process and adjusted to align with the flow of services involving various parties involved. Interviews with 11 informants provided insights into the ambulance

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service flow, which is depicted in the swimlane diagram (Figure 1).

A difference was noted between the flow of services for car ambulances and ship ambulances. The ship ambulance units, specifically serving the Thousand Islands region differed in terms of permits. The flow of ship ambulance services is illustrated in the swimlane diagram (Figure 2).

This study presents a flow diagram of the ambulance service process, identifying problems from the call center to the emergency department. The constraints encountered were compiled into a table and adapted to the flow of ambulance services as depicted in the swimlane diagram. The initial constraints could affect the response time of ambulance services. According to (Heryani, 2022), the effectiveness of response time depends on call processing time, team preparation time in the ambulance, and time for the ambulance to reach the scene.

Table 1. Constraints in the Ambulance Service Process

Stages	Explanation
Processing of ambulance calls	Access to 119 services in the community faces obstacles, including a lack of interaction from patients' families, lack of CCA call center officers, insufficient understanding of patient locations, application errors, and un-integrated ship ambulance unit.
Disposition of the CCA call center to operations officers	Obstacles that occur are signal interference and officers forgetting to report both the results of activities and checking tools and units
Preparation of ambulance team	The operations staff are understaffed, with many unproductive and unresponsive officers. Additionally, vehicles are not working properly and equipment and medicines are unclean.
Ambulance response time	Traffic jams, difficult access for ambulance and URC units, long distances, unsuitable location, natural disasters like floods and bad weather, close proximity of unit posts, and accidents in the middle of the highway are common issues.
Patient observation	There are crowding at the location, Initiatives by standers around to lift or move patients, officers experiencing fatigue, the improper of devices carried out by officers to patients, and officers handling to the crowd around the location while handling patients.
Referral hospital search	Patients with special conditions make it difficult to find a hospital, SISRUTE is still in the development stage, and the hospital's response is slow.
Patient transfer to the emergency room	There are traffic jams, there is no coordination with volunteers opening the way for the ambulance, the patient's family cannot wait, and there are patient requests regarding the intended referral hospital.
Reporting of activity results	There are files that do not comply with the provisions, the Thousand Islands's report is still mixed with that of North Jakarta area, and the report is still in paper form.

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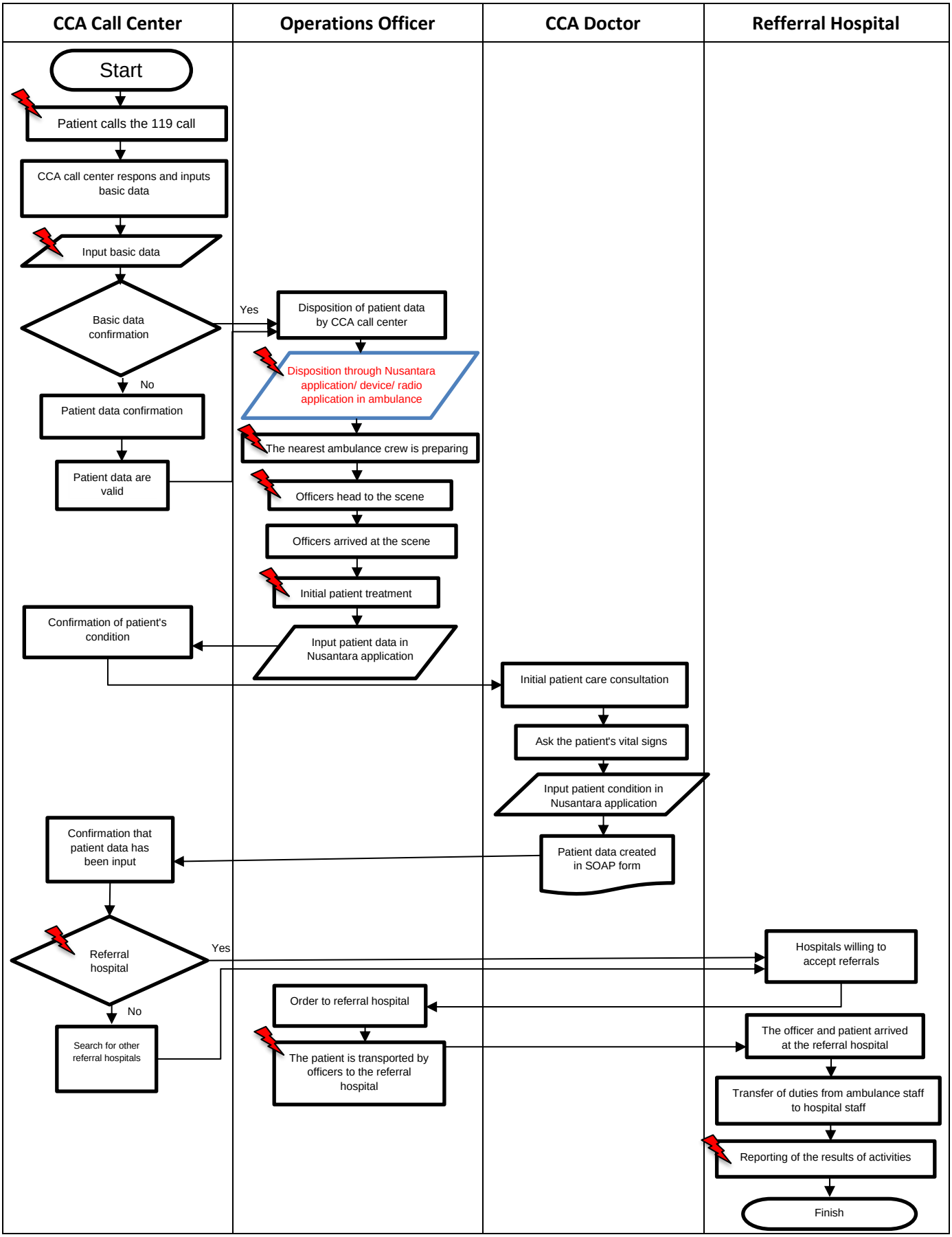

Figure 1. Ambulance Service Flow (Swimlane Diagram)

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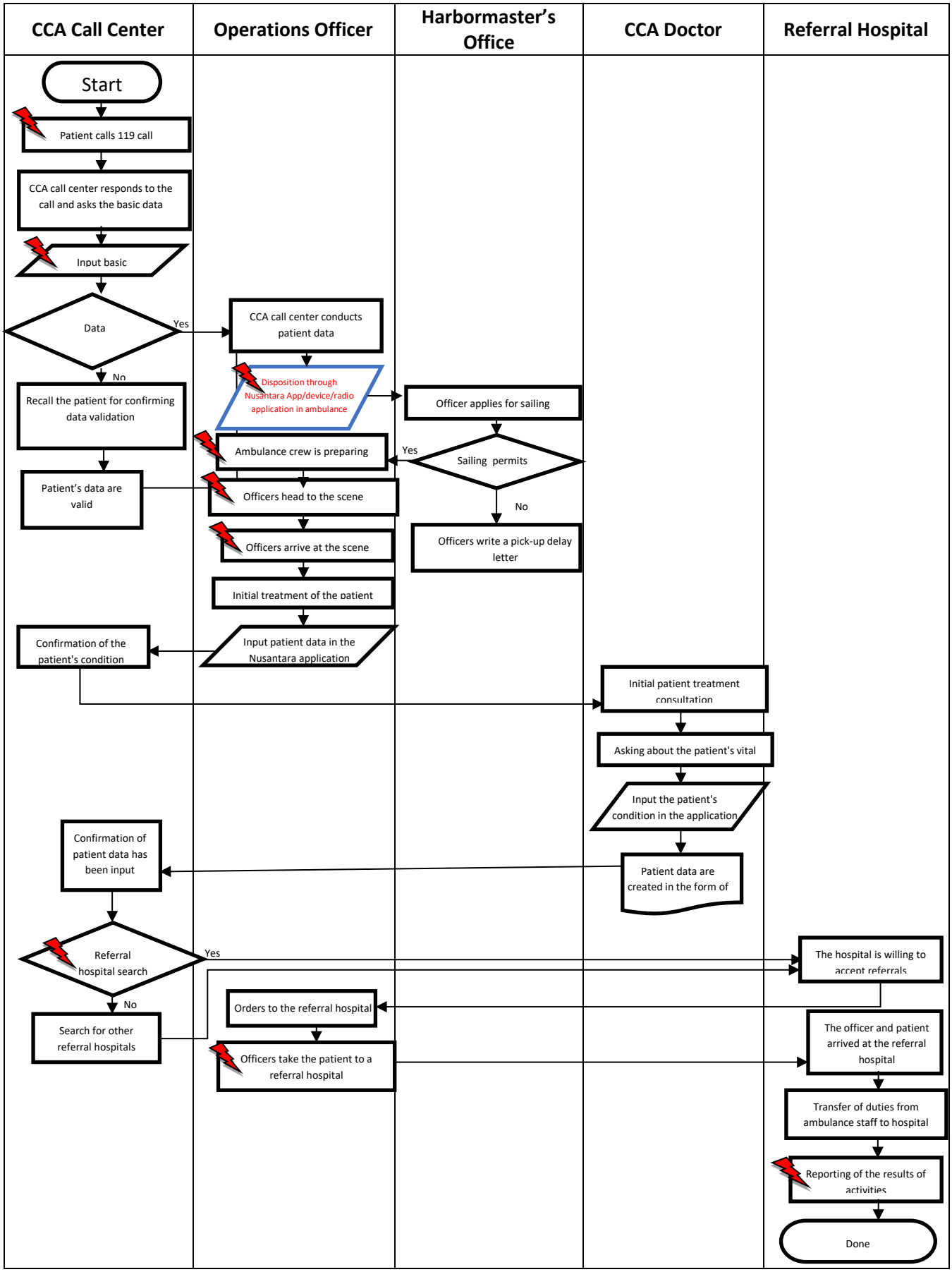

Figure 2. Ambulance Service Flow in the Thousand Islands (Swimlane Diagram)

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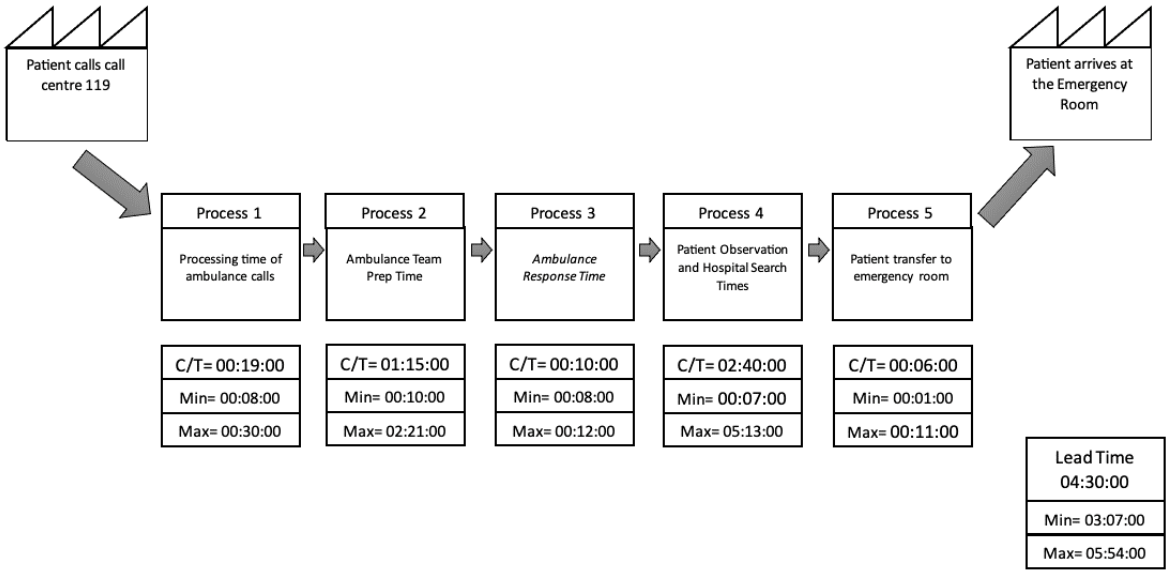

Figure 3. Stream Map of the Ambulance Service Flow

Table 1. Identification of Value-Added and Non Value-Added Ambulance Services Activities

Process	No.	Activity	*Cycle Time*
Processing of ambulance calls	1.	The patient calls the 119-call center	00:19:00
	2.	The call center responds to the calls	
	3.	The call center asks for basic patient data	
	4.	The call center confirms patient data	
Ambulance team standing by	5.	The call center distributes patient data to operations officers	01:15:00
	6.	The closest operations officer from the location made preparations	
Ambulance *response time*	7.	Operations officers go to the location of the patient	00:10:00
	8.	Operations officers arrive at the location of the patient	
Patient observation time	9.	Operations officers perform initial treatment of the patient	02:40:00
	10.	Operations officers enter patient data in the Nusantara application	
	11.	Operations officers confirm patient data to the CCA call center	
	12.	Operations officers consult with the CCA doctor	
	13.	The doctor asks the patient's vital signs	
	14.	Patient data are generated in SOAP form by the CCA doctor	
Hospital search by the CCA *call center*	15.	Confirmation of patient data that have been input	
	16.	Searching of a referral hospital	
	17.	The referral hospital is willing to accept the patient	
	18.	Operations officers are instructed to take the patient to the referral hospital	
Patient transfer to the ED	19.	The patient is transferred to the referral hospital	00:06:00
	20.	Officers arrive at the referral hospital	
		Total	**04:30:00**

Duration of Ambulance Services

The duration of ambulance service was analyzed in the Measure stage. The Measure phase is the measurement stage aimed at improving processes by sorting components for enhancements. Measurements in the Measure phase use Value Stream Mapping (VSM) (Graban, 2016). The data in the form of documents were obtained from the Nusantara application, which provided 4,389 cases related to ambulance services. These cases were processed and reviewed to assess ambulance service times. The findings from observations and document reviews were translated into a *value stream map* (VSM) to provide an overview of ambulance service time (Figure 3).

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Due to limitations in direct observation, this study could not fully capture all value added and non-value-added activities. As a result, additional data were obtained from interviews and document reviews. Table 2 explains both value-added and non-value-added activities.

According to the National Fire Protection Association (NFPA) in 2016, response time is determined from the receipt of a call by the emergency call center to the arrival of the vehicle at the scene (Oh, Hessami and Yang, 2019). One of the causes of the inaccuracy in the ambulance response time was the long patient registration process. The results of this study revealed that non-value-added significantly prolonged the time required for ambulance services, especially during patient observation and the search for referral hospitals by command control ambulance (CCA) call center officers. These findings are depicted in a value stream map of the ambulance service, including an explanation of the activities involved in each process.

Table 2. The Number of Hospital Rejections

No.	Region	Hospital	Accepted	Rejected	Missed	Total
1	East Jakarta	Budhi Asih Hospital	194	271	190	655
2	West Jakarta	Cengkareng General Hospital	194	198	38	430
3	East Jakarta	Duren Sawit Special Hospital	83	118	51	252
4	East Jakarta	Pasar Rebo Hospital	118	112	114	344
5	North Jakarta	Koja Hospital	295	61	35	391
6	Central Jakarta	Taracan Hospital	442	205	192	839
7	South Jakarta	Sunday Market Hospital	190	265	66	521
8	South Jakarta	Kebayoran Lama Hospital	8	19	28	55
9	North Jakarta	Tugu Koja Hospital	0	4	8	12
10	South Jakarta	Tebet Hospital	4	24	33	61
11	Central Jakarta	Kemayoran General Hospital	3	9	11	23
12	Central Jakarta	Cempaka Putih Hospital	0	2	3	5
13	West Jakarta	Tamansari Hospital	0	1	7	8
14	East Jakarta	Mataram Hospital	1	14	21	36
15	East Jakarta	Kramat Jati Hospital	1	3	25	29
16	North Jakarta	Pademangan Hospital	5	8	3	16
17	East Jakarta	Ciracas Hospital	3	6	1	10
18	South Jakarta	Mampang Prapatan General Hospital	4	15	27	46
19	West Jakarta	Kalideres Hospital	0	2	9	11
20	South Jakarta	Pesanggrahan Hospital	2	7	11	20
21	Central Jakarta	Sawah Besar Hospital	10	10	0	20
22	North Jakarta	Cilincing Hospital	4	2	1	7
23	West Jakarta	Kembangan Hospital	2	6	5	13
24	South Jakarta	Kabayoran Baru Hospital	15	12	24	51

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The Roots Causes of Prolonged Ambulance Service Time

Desai, Rawani and Loya (2019) identified several crucial factors that can affect ambulance response time, namely the location of the ambulance, the number of ambulance units, traffic conditions, and the possibility of delays with emergency call center officers. The investigation of the root causes of prolonged ambulance service time revealed that a specific issue with the CCA call center officers when referring patients to hospitals. A significant problem was the high rate of hospital rejections due to claimed full capacity, even though there were empty beds available. This issue contributed to delays in referring patients to the nearest referral hospital. Therefore, it is necessary to implement regulations that prevent hospitals from rejecting emergency patient. Therefore, the Ministry of Health of the Republic of Indonesia must facilitate communication with the DKI Jakarta Health Office and all health service facilities to ensure that no emergency patients are turned away when referred to these facilities. This requirement aligns with Law No. 36 of 2009 concerning Health, specifically Article 32, which prohibits hospitals, as health service facilities, from refusing emergency patients and mandates that they provide services to save patients' lives. Furthermore, Article 85 of Law No. 36 of 2009 mandates that in emergency situations, both public and private health service facilities are obligated to provide health services and are prohibited from denying care to patients. Table 3 provides data on the number of hospital rejections involving emergency patients.

The root causes were analysed based on the results of interviews conducted with 11 informants, observations, and document reviews. The root cause analysis categorized the problems into machine, method, man, and environment. Environmental problems were most common, with a large number of root causes, including crowds, proximity between posts, difficult access for ambulances and URC units, community initiatives, CCA call center officers waiting for decisions from patients' families, difficulties in finding referral hospitals, and special requests from patients' families.

Based on the root cause analysis, recommendations were formulated in the fourth stage of the DMAIC framework, namely the Improve stage. According to Arcidiacono, Calabrese, and Yang (2012), the Improve phase is utilized to identify and design enhancements based on data analysis, as well as to implement these improvements using lean methodologies (Arcidiacono, Calabrese and Yang, 2012). The constraint analysis was informed by focus group discussions (FGDs) conducted with several informants. The recommended improvements are intended to enhance performance efficiency on an ongoing basis as follows.

The Nusantara application has several errors and bugs, which can be addressed through education and training for the IT officers managing the application at the Emergency Ambulance Service Unit of the DKI Jakarta Health Agency. This education and training should involve experts with competence in application management and maintenance. This aligns with the research conducted by Khairunnisa *et al.* (2024), which indicates that training and development have a positive and significant impact on employee performance. Specifically, these initiatives improve employees' ability to serve customers, enhance service quality, increase productivity, and foster a positive impression of customer satisfaction and employee loyalty. The Institute for Training and Development of Information and Communication Technology (BPPTIK) offers training programs, including training for civil servants, which can enhance IT competence.

The Integrated Referral (SISRUTE) is still under development. To address this issue, the Emergency Ambulance Service Unit of the DKI Jakarta Health Agency can provide feedbacking to the Ministry of Health regarding the inefficiency of the application, such as conducting disseminations about the use of SISRUTE across all hospitals in the DKI Jakarta area in which relevant officers must participate. The disseminations should introduce the system and the benefits of using an

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integrated referral system, as well as mandate its implementation across hospitals. This is under Law Number 17 of 2023 on Health, which mandates that Health Information System providers implement governance that supports health services. Both Central and Regional Governments are responsible for enhancing access to and the quality of health services by utilizing SISRUTE, a health service information system designed to expedite the referral process according to the patient's medical needs.

To address difficulties in finding referral hospitals due to slow hospital response and rejection by officers the use of SISRUTE should be reinforced and policies should be established. The Indonesian Ministry of Health and the DKI Jakarta Health Agency should implement policies that require health service facilities to accept referral patients. According to Law Number 44 of 2009, hospitals are obliged to provide emergency services. Additionally, the performance of officers with slow response times should be evaluated using key performance indicators (KPIs) to ensure compliance with regulations and facilitate effective monitoring of their performance.

The installation of patient's equipment was disorganized and officers forgot to include check sheets for tools, and medicines, drug supplies, as well as renewing their driver's licenses. To address these issues, improvement efforts should focus on using a kaizen board to optimize process efficiency by eliminating waste (Arcidiacono, Calabrese and Yang, 2012). Kaizen incorporates the PDCA (Plan-Do-Check-Act) cycle. Officers can use this cycle by (1) identifying and documenting the problems that occur and their causes, followed by developing solutions (Plan); (2) implementing the improvement plan and coordinating with the relevant unit (Do); (3) evaluating the effectiveness of the improvements (Check); and (4) taking preventive measures to avoid recurrence once the problems are resolved.

To enhance response times for officers who forget to report, GPS location detection can be integrated into ambulance tabs to track activity times. This can be analyzed using performance indicators to enhance response times (IKU and IKI). Additionally, remapping related posts based on factors such as call volume, emergency cases, proximity to health service facilities, signal strength, and extinguisher range can optimize post location, as suggested by Heryani (2022).

For areas with difficult access to ambulances and URC units, electric scooters can be used to navigate difficult roads. This solution can save time and facilitate easier access for officers. Research by Satria *et al.* (2017) suggested that electric scooters can move up to 20 km/hour on flat surfaces, making them suitable for high-density population areas with frequent emergency incidents.

Community initiatives related to lifting and moving patients were reviewed in the context of work instructions for victim handling (IK-SIP-15) by adding points about not moving patients for their families or companions. In addition, to address problems that arise from the community, public education on emergency patient handling is necessary. This education could be delivered through social media channels owned by the Emergency Ambulance Service Unit of the DKI Jakarta Health Agency, enhancing public awareness and understanding of emergency patients cares.

Crowding at the scene and special requests from the patients' families regarding referral hospitals were reviewed in the context of work instructions for victim handling (IK-SIP-15) by adding points about the maximum distance patients can be transported and the conditions at the location during initial treatment. These revisions aim to manage crowds and address special requests by setting standards for patient transportation and scene management. To improve the conditions at the location, collaboration with security officers should be implemented to restrict access for non-essential individuals and establish traffic cone boundaries around accident or emergency scenes.

This study utilized secondary data, which may not be in real-time. However, the authors manually verified the data to rectify any incomplete entries or inappropriate

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time formats, ensuring that the data remained usable.

Conclusion

This study, which included observations, document reviews, and in-depth interviews, provides an overview of the flow of ambulance services. Several problems tended to arise at the beginning of the process, namely during the receipt of call from the patient by the 119 call center to the initial treatment carried out by officers. Nonvalue-added activities in ambulance services, such as preparation, observation, and hospital search, can cause bottlenecks. The least time-consuming non-value-added activity was transferring patients to the emergency department. Additionally, the problems were categorized into man, method, machine, and environment, with the man category supporting the services. The average ambulance service time is 4 hours and 30 minutes, with the longest being 2 hours and 40 minutes for patient observation and hospital search. Common waste types included waiting, defects, motion, transportation, overprocessing, and overproduction, with waiting being the most common.

The authors recommend short-term solutions including providing IT education and training sessions by inviting experts competent in application usage and maintenance for IT staff at AGD *Dinas Kesehatan DKI Jakarta*, using electric scooters to navigate densely populated areas, providing recommendations to the Ministry of Health regarding application usage that is considered ineffective due to constraints affecting performance and service effectiveness, using GPS systems to monitor activity times, explaining emergency handling protocols to patient families during treatment, analysing workloads, and reviewing hospital staff performance through the use of SISRUTE.

The authors recommend several long-term solutions, which include enhancing the use of SISRUTE as a referral system for emergency patients, implementing policies that require referral hospitals to accept emergency patients, and re-mapping ambulance unit posts by considering various influencing factors to optimize location determination. Additionally, they suggest revising the emergency victim handling work instruction (IK-SIP-15) to incorporate variables for initial location assessment during treatment, establishing a maximum distance limit for patient transport, and modifying the work instruction to include guidelines for not moving patients while assisting their families or companions during emergencies. Implementing these recommendations will help address current challenges and improve overall service quality.

Abbreviations

EMS: Emergency Medical Services; SPGDT: *Sistem Penanggulangan Gawat Darurat Terpadu* (Integrated Emergency Management System); PSC: Public Safety Center; DKI JAKARTA; VSM: Value Stream Mapping; DMAIC: Define, Measure, Analyse, Improve, and Control; FGD: Focus Group Discussion; BPPTIK: *Balai Pelatihan dan Pengembangan Teknologi Informasi dan Komunikasi* (Institute for Training and Development of Information and Communication Technology); IT: Information Technology; PDCA: Plan, Do, Check, and Action; URC: *Unit Reaksi Cepat* (Rapid Response Unit); GPS: Global Positioning System.

Declarations

Ethics Approval and Consent Participant

This study received ethical approval from the Faculty of Public Health, University of Indonesia with a certificate number Ket-439/UN2.F10.D11/PPM.00.02/2023. Prior to data collection, written informed consent was obtained from each informant. To ensure confidentiality, all personal identifiers were replaced.

Conflict of Interest

The authors have no conflicts of interest to declare.

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Availability of Data and Materials
The data and materials are available upon request to the authors.

Authors' Contribution
TSPR and MB developed the concept and methodology; TSPR drafted the original manuscript; all authors reviewed and evaluated the manuscript.

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