

PERAN PETUGAS PENGENDALI PELAYANAN MEDIS (P3M) TERHADAP LENGTH OF STAY (LOS) PASIEN DI IGD RS AKADEMIK UGM

The Role of the Emergency Flow Coordinator (EFC) on the Length of Stay (LOS) of Patients In the UGM Academic Hospital's Emergency Department

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ABSTRACT

Background: Overcrowding in Emergency Departments (ED) poses complex challenges, notably regarding patient waiting times or Length of Stay (LOS). The Emergency Flow Coordinator (EFC) at UGM Academic Hospital plays a critical role in regulating patient flow in the ED, yet their specific impact on reducing LOS remains insufficiently defined.

Objective: The aim of this study is to determine the impact of the role of EFC on the Length of Stay (LOS) in the Emergency Department of UGM Academic Hospital

Methods: A cross-sectional study employing structured questionnaires assessed the EFC's function in the ED, gathering responses from all medical personnel (nurses and physicians) on duty. Analysis of secondary data on patient LOS before (from October 2022 to January 2023) and after (from February 2023 to January 2024) EFC implementation was conducted.

Results: According to the Director's Decree of UGM Academic Hospital, the majority of the respondents 90% (45) who assessed EFC (11) considered that EFC plays a very important role in carrying out their job descriptions. From registration to inpatient admission, the average duration of patients in the ED was recorded at 190 minutes (n=9805), which was a decrease of 17.21% from the duration before EFC, which was 229.5 minutes (n=472). The Wilcoxon sum-rank test was used to analyze the difference in LOS between before and after the EFC policy was implemented. The p-value was 0.001, indicating statistical significance.

Conclusions: The EFC is essential in fulfilling its duties, as evidenced by a significant reduction in ED patient LOS following its implementation, enhancing the efficiency of care delivery.

Keywords: Overcrowding, Emergency Department (ED), Length of Stay (LOS), patient flow

ABSTRAK

Latar belakang: Kepadatan di Instalasi Gawat Darurat (IGD) menimbulkan tantangan yang kompleks, terutama terkait dengan waktu tunggu pasien atau Length of Stay (LOS). Petugas Pengendali Pelayanan Medis (P3M) di RS Akademik UGM memegang peranan penting dalam mengatur arus pasien di IGD, namun dampak spesifiknya dalam mengurangi LOS masih belum cukup dijelaskan.

Tujuan: Penelitian ini bertujuan untuk mengetahui pengaruh peran Petugas Pengendali Pelayanan Medis (P3M) terhadap Length of Stay (LOS) di IGD RS Akademik UGM.

Metode: Penelitian cross-sectional yang menggunakan kuesioner terstruktur menilai fungsi P3M di IGD, dengan mengumpulkan tanggapan dari seluruh tenaga medis (perawat dan dokter) yang bertugas. Analisis data sekunder LOS pasien sebelum (Oktober 2022 hingga Januari 2023) dan setelah (Februari 2023 hingga Januari 2024) penerapan P3M dilakukan.

Hasil: Sebagian besar responden 90% (45) yang menilai P3M (11) menilai bahwa P3M sangat berperan dalam melakukan uraian tugasnya sesuai dengan SK Direktur RS Akademik UGM. Setelah penerapan P3M, rata-rata durasi pasien di IGD sejak registrasi hingga pemindahan ke ruang rawat inap tercatat 190 menit (n=9805) yang mengalami penurunan 17.21% dari durasi sebelum P3M yang mencapai 229.5 menit (n=472). Analisis dengan uji Wilcoxon sum-rank dilakukan untuk melihat perbedaan LOS antara sebelum dan setelah diberlakukannya kebijakan P3M menghasilkan nilai $p < 0.001$ yang menunjukkan signifikansi statistik

Kesimpulan: P3M sangat penting dalam memenuhi tugasnya, terbukti dengan adanya penurunan signifikan LOS pasien IGD setelah penerapannya, sehingga meningkatkan efisiensi pemberian layanan.

Kata Kunci: Kepadatan, Instalasi Gawat Darurat (IGD), Length of Stay (LOS), Arus Pasien

INTRODUCTION

The phenomenon of patient density within ED represents a pervasive issue, as evidenced in the ED of UGM Academic Hospital. Density can lead to a decrease in the quality of patient care, delays in administration of therapies, a decrease in patient safety, and deterioration compliance with service protocols. The issue of density is multifaceted, influenced by various contributing factors, one of which pertains to the duration of patient waiting times or length of stay (LOS) within the ED¹.

Emergency Department Length of Stay (EDLOS), commonly referred to as patient waiting time within the ED, is quantitatively assessed in minutes, commencing from the point of patient registration until the patient departs from the ED, regardless of whether the patient is discharged, transferred to another healthcare facility, or admitted to an inpatient unit. According to established international benchmarks for EDLOS, an acceptable waiting time within the ED is delineated as being less than 4 hours¹. Prolonged waiting periods result in an accumulation of patients within the ED, which may lead to a variety of negative outcomes, including reduced patient satisfaction, increased anxiety level for both patients and their families, staff burnout, escalated workload for personnel, and obstructed service delivery².

Mitigating patient density within the ED can be achieved through several strategies, one of which involves enhancing patient throughput by minimizing the duration of patient stay within the ED^{3,4}. A decrease in the duration of patient hospitalization is a primary objective anticipated to be realized to mitigate patient density, which correlates with improved patient satisfaction, alongside a decrease in morbidity and mortality rates^{4,5}. One literature suggests that this role can be undertaken by senior nurses during shifts, focusing on the early identification of delays in patient processing and the ability to resolve issues to expedite patient processing, thereby reducing patient stay time in the ED and minimizing patient density.

The EFC at UGM Academic Hospital is responsible for managing patient flow in the ED. Prior research demonstrates that the presence of an ED nurse coordinator will assist patient flow and achieve the target waiting time in the ED, which is 4 hours⁴. Furthermore, another study revealed that the implementation of the ED nurse coordinator resulted in a statistically significant decrease in admission duration, length of stay, transfer intervals, and patient assessment durations within the ED⁶.

At the UGM Academic Hospital ED, the EFC was officially inaugurated by the director in January 2023 and implemented in February 2023. Given that it has not yet been a year since its establishment, the impact of EFC on reducing ED Length of Stay (EDLOS) for

patients remains undetermined. Consequently, this research was conducted to elucidate how EFC's role in mitigating EDLOS can enhance the quality of emergency services at UGM Academic Hospital.

METHODS

This study employs a cross-sectional study using a questionnaire to assess the role of emergency flow coordinator in the ED of UGM Academic Hospital. The questionnaire encompasses 4 dimensions including the role of identification and problem-solving, decision-making, communicator, and facilitator, comprising 20 validated items. There are 11 nurses who are Emergency Flow Coordinator (EFC) whose performance will be assessed by respondents through the questionnaire. Additionally, secondary data regarding the LOS of patients in the ED was collected from emergency flow coordinator report data during the on-duty shift.

The population and sample of this study are divided into two categories: the population and sample concerning the role of emergency department flow coordinator, and the population and sample related to LOS. The population and sample for the role of emergency flow coordinator are derived from responses to the questionnaires completed by emergency department doctors (n=35) and nurses (n=15) who are not included in the emergency flow coordinator. Meanwhile, regarding the LOS of patients, the population in this study includes all emergency department flow coordinator report data from the ED of UGM Academic Hospital prior to the establishment of emergency flow coordinator, specifically from October 2022 to January 2023 (n=517), and subsequent to the establishment of emergency flow coordinator, from February 2023 to January 2024 (n=12.209). The sample size for this LOS patient study is determined using the consecutive sampling method. Following the exclusion criteria, a total of 417 samples were collected prior to the establishment of the emergency flow coordinator, while 9805 samples were gathered subsequent to the emergency flow coordinator's establishment.

Sociodemographic and clinical data are presented in terms of mean or median for numerical data and in proportion presentation for categorical data. The Shapiro-Wilk test is conducted on numerical data variables to assess normality. Following this, either an unpaired t-test or Wilcoxon sum-rank test is applied, contingent upon the distribution of the data. Subgroup analysis is executed to evaluate differences in length of stay prior to and following the implementation of the EFC policy, based on admission hours. A p-value of less than 0.05 is regarded as

statistically significant. All statistical analyses are conducted utilizing STATA 17.0 software (StataCorp, USA).

The researcher conducts a comprehensive analysis to evaluate the factors contributing to a Length of Stay (LOS) exceeding four hours through the application of open coding⁷. This methodology entails the systematic organization of responses into a series of significant categories that encapsulate all pertinent data. The identified reasons are classified into various factors leading to LOS >4 hours, specifically during the emergency flow coordinator has been established or started carrying out its duties. Meanwhile, data before the existence of emergency flow coordinator has not provided data that gives points to describe the factors affecting the length of LOS in the ER. The LOS data for each delay is presented in the research findings as a median value, encompassing minimum and maximum durations.

RESULTS

Characteristics of EFC

In the period from February 2023 to January 2024, the ED of UGM Academic Hospital has 11 Emergency Flow Coordinators (EFC) who are responsible for managing patient flow in the ED. The characteristics of EFC can be seen in the following table:

Table 1. EFC Characteristics

No	Characteristics	Frequency	Percent (%)
Gender			
1	Women	7	63.64%
	Men	4	36.36%
Age (years)			
2	30-35	2	18.18%
	36-40	8	72.73%
	41-45	1	9.09%
Position			
3	Nurses	7	63.64%
	Nurses diploma	4	36.36%
Last Education			
4	Bachelor degree	7	63.64%
	Diploma 3	4	36.36%
Employment Status			
5	Contract	6	54.55%
	Permanent Employees	2	18.18%
	Civil Servants	3	27.27%
Length of work			
6	>10 years	10	90.91%
	<10 years	1	9.09%

Source: Primary Data (2024)

Based on the table above, it is evident that the characteristics of emergency flow coordinator within the ED of UGM Academic Hospital from February 2023 to January 2024 reveal that 7 individuals (63.63%) are female. In terms of age demographics, the EFC cohort predominantly falls within the age range of 36 to 40 years (72.73%). Regarding educational qualifications and professional roles, 7 individuals (63.63%) hold a Bachelor's degree and are employed as Nurses. The employment classification during the specified timeframe indicates that 6 individuals (54.55%) are contract employees, 3 individuals (27.27%) are civil

servants, and 2 individuals (18.18%) are permanent staff members. Furthermore, it is noted that 10 individuals (90.91%) have been employed at UGM Academic Hospital for more than 10 years.

The Role of Emergency Flow Coordinator

The efficacy of EFC is evaluated through a questionnaire that encompasses four dimensional components: problem identification and solving, decision making, communicator, and facilitator. The roles of EFC are categorized into three distinct classifications: minimally involved, moderately involved, and highly involved. The respondents who completed the questionnaire were emergency unit doctors (n=35) and nurses (n=15) who were not included in the emergency flow coordinators.

The results of categorization reveal that 45 respondents (90%) perceive EFC as highly involved in fulfilling their responsibilities as medical service control officers, in alignment with the Director's Decree of UGM Academic Hospital. This evaluation encompasses the dimensions of problem identification and problem-solving, decision-making, communicator, and facilitator, all of which are pertinent to the Length of Stay (LOS) of patients within the ED of UGM Academic Hospital.

Comparison of LOS Pre and Post Emergency Flow Coordinator

The LOS outcomes for emergency department patients prior to and subsequent to the implementation of EFC. A total of 472 emergency department patient samples were analyzed, resulting in a median LOS of 229.5 minutes, with a minimum duration of 59.4 minutes and a maximum duration of 587.6 minutes. Following the implementation of EFC, there were 9,805 patient samples, with an average LOS in the ED recorded at 190 minutes, ranging from a minimum of 16 minutes to a maximum of 1,093 minutes. A comparative analysis of pre- and post-EFC implementation yielded a p-value of less than 0.001, indicating statistical significance.

Table 2. Difference in Length of Stay Between Before and After the Implementation of Emergency Flow Coordinator (EFC)

Variable	Pre-EFC (n=472)	Post-EFC (n=9,805)	Z-score	p-value
	Median (Min-Max) in minutes	Median (Min-Max) in minutes		
Length of Stay	229.5 (59.4-587.6)	190 (16-1093)	9.367	<0.001*

Wilcoxon sum-rank test

* = p<0.05

Abbreviation: Min=minimum; Max=maximum

Source: Primary Data (2024)

In Table 3, the comparison of LOS of patients before and after the implementation of EFC, categorized according to the time of patient presentations to the ED, specifically during morning, afternoon, or evening shifts. In the morning shift, the median LOS recorded was 234.2 minutes before EFC and 194 minutes post-EFC, indicating a significant reduction in LOS, with a statistical significance (p value <0.001). For the afternoon/evening shift, the median LOS reported was 212.5 minutes for pre-EFC and 192 minutes for post-EFC, which shows a significant decrease in LOS with statistical significance (p value <0.001). During the night shift, the median LOS was 245.9 minutes for pre-EFC and 179 minutes for post-EFC, which also reflects a significant decrease in LOS and is statistically significant (p value <0.001).

Table 3. Difference in LOS Between Before and After the Implementation of Emergency Flow Coordinator, Based on the three shifts

Variable	Pre-EFC (n=472)	Post-EFC (n=9,805)	Z-score	p-value
	Median (Min-Max) in minutes	Median (Min-Max) in minutes		
Morning LOS	234 (60-574)	194 (16-1093)	6.825	<0.001*
Afternoon LOS	212.5 (66.5-560.6)	192 (23-821)	2.702	<0.001*
Night LOS	245.9 (59.4-587.6)	179 (16-957)	5.476	<0.001*

Wilcoxon sum-rank test

* = p<0.05

Abbreviation: Min=minimum; Max=maximum; Morning LOS=length of stay during morning shift (07.00-14.00); Afternoon LOS=length of stay during afternoon shift (14.00-21.00); Night LOS=length of stay during night shift (21.00-07.00)

Source: Primary Data (2024)

DISCUSSION

The Role of Emergency Flow Coordinator (EFC)

The EFC is a senior nurse tasked with managing patient flow. Literature categorizes the EFC's role as a nurse coordinator into four dimensions: identification and problem-solving, decision-making, communicator, and facilitator. The findings of this study suggest that EFC fulfills its responsibilities effectively, with the majority categorized as having a substantial impact.

Effective leadership qualities in the EFC are imperative for managing the dynamic complexities of the ED, directly influencing decision-making and team dynamics⁸. The EFC nurse must be able to perform their role as a leader or coordinator who manages the flow of patients within the ED duty team. Leadership qualities are essential for the EFC to guide, influence, and motivate the team, enhancing decision-making and communication. Overall, the EFC's effectiveness is crucial for improving patient care quality and enhancing patient and family satisfaction⁸.

The literature indicates that the ED nurse coordinator is pivotal in identifying service process delays and implementing solutions to ensure timely patient care⁴. Research suggests that the presence of a nurse coordinator accelerates both ED waiting times

and patient transfers to inpatient care⁶. Furthermore, effective communication and interpersonal relationships are essential for nurse coordinators to facilitate efficient service delivery and foster team collaboration^{6,8}. Thus, the EFC is expected to play a good role in identification and problem-solving, decision-making, communication, and facilitation. The EFC will subsequently have an effect on the rise in patient and family satisfaction.

Comparison of LOS Pre and Post Emergency Flow Coordinator (EFC)

In this study, the median LOS in the ED before and after EFC implementation was 229.5 minutes and 190 minutes respectively, demonstrating a statistical reduction (p < 0.001). This aligns with research conducted by P. S et al in 2016 in India which assessed the effects of ED nurse coordinators in optimizing the workflow of the ED, showing a decrease in patient LOS after the implementation of the ED nurse coordinator⁶.

The LOS for patients across the three shifts showed a significant decrease in median LOS (p<0.001). In the morning shift, the median LOS pre EFC was 234.2 minutes and LOS post EFC was 194 minutes. Meanwhile, in the afternoon shift there was a median LOS pre EFC of 212.5 minutes and LOS post EFC was 192 minutes, while in the night shift there was a median LOS pre EFC of 245.9 minutes and LOS post EFC of 179 minutes, all of which showed a decrease in LOS and were statistically significant (p value <0.001).

This is also consistent with research conducted by Murphy, S et al in Kansas City in 2014 which found that with the presence of a flow coordinator in the ED, it can improve patient flow and can provide significant results for hospitals¹⁰. Additionally, Lee, SR 2022 study in South Korea demonstrated that the presence of a patient flow manager is an effective intervention in reducing the LOS of ED patients, as there was a significant decrease in the LOS of ED patients by 4.07 hours¹¹. Several factors contribute to the increase LOS observed by EFC, including delays in specialist consultations results, unprepared inpatient rooms, the need for stabilization, crowded ED, extended decision-making times, laboratory delay, observation in the ED, difficulties contacting specialist, changes in the patient's clinical condition, changes in inpatient rooms, specialist visits to the ED, inpatient rooms being difficult to contact, radiology procedures, miscommunication, and others.

The main factor contributing to LOS is the wait for specialist consultation results, occurring in 24% of 5,525 patients, aligning with K. Payne et al's research in 2023, which identifies specialist consultations as the main cause of prolonged LOS, particularly in complex cases. Additionally, variations in response and decision-making among junior and senior specialists can influence consultation outcomes.¹²

A secondary cause, specifically the unpreparedness of the ward or the lack of available inpatient wards, occurs with a prevalence of 14.5%. This observation aligns with the findings of K. Payne et al. in 2023, which indicate that delays in the accessibility of inpatient beds lead to prolonged LOS in the ED. This phenomenon is undoubtedly influenced by various factors, including a deficiency of inpatient beds, inadequate staffing, and sluggish patient discharge procedures¹².

The limitation of this study is that the LOS collection process between pre and post EFC is different. Before EFC, data are collected manually, whereas after EFC data are collected digitally using electronic medical records, which raises a bias risk due to human error and incomplete data.

CONCLUSION

The Emergency Flow Coordinator (EFC) are considered to play a significant role in carrying out their duties as medical service control officers in accordance with the Director's Decree of UGM Academic Hospital, which includes the dimensions of role identification and problem-solving, decision-making, communication, and facilitation adjusted to the LOS of patients in the ED of UGM Academic Hospital. Meanwhile, the LOS in the ED has significantly shortened from 229.5 minutes before the implementation of EFC to 190 minutes after the implementation of EFC. The reason or obstacle that is the most significant factor in the lengthening of LOS in the ED of UGM Academic Hospital is waiting for the consultation results with specialists. The EFC is considered to play a significant role in carrying out its duties, and when the role of EFC was enforced, LOS in the ED significantly experienced a reduction in time, faster than before the role of EFC was enforced. It is anticipated that UGM Academic Hospital will establish more precise guidelines concerning the requirements, responsibilities, roles, and powers of the EFC in order to avoid overload. Other academic hospitals can use EFC as a model to decrease ED overcrowding and increase service efficiency by coordinating patient flow in the ED.

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