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OVERVIEW OF PRE-HOSPITAL NURSING INTERVENTIONS IN TRAUMA AND NON-TRAUMA CASES AT PMI AMBULANCE SERVICES OF SIDOARJO REGENCY

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ABSTRACT

Pre-hospital nursing care is an essential component of emergency services provided from the onset of an emergency until the patient receives further care at a health facility. This study aimed to describe pre-hospital nursing interventions in trauma and non-trauma cases at PMI Ambulance Services of Sidoarjo Regency. This study employed a descriptive design with a retrospective approach. The sample consisted of 103 patient records obtained from the ambulance service registry of PMI Sidoarjo Regency for 2022–2024 using total sampling. The study variables included case type, response time, level of consciousness, blood pressure, pulse rate, respiratory rate, oxygen saturation, and pre-hospital nursing interventions. Data were analyzed descriptively and presented as frequency and percentage distributions. Most patients were trauma cases (72; 69.9%), while 31 patients (30.1%) were non-trauma cases. Most ambulance services had a fast response time of ≤15 minutes (70; 68.0%). Level of consciousness was dominated by Compos Mentis (80; 77.7%). Most patients had normal pulse rate (88; 85.4%), normal respiratory rate (89; 86.4%), and normal oxygen saturation (92; 89.3%), while 63 patients (61.2%) had blood pressure categorized as abnormal. The most frequently performed intervention was vital signs assessment (103; 100%), followed by evacuation (81; 78.6%), wound care (61; 59.2%), and observation (42; 40.8%). In trauma cases, wound care was the most frequent intervention (59; 81.9%), whereas in non-trauma cases evacuation (30; 96.8%) and observation (25; 80.6%) were most frequent. These findings indicate that pre-hospital nursing interventions at PMI Ambulance Services of Sidoarjo Regency were provided according to the clinical condition and needs of patients in trauma and non-trauma cases.
Keywords: Pre-Hospital Nursing; Ambulance; Trauma; Non-Trauma; Emergency Care

INTRODUCTION

Emergency patient outcomes are strongly influenced by the speed and appropriateness of care provided from the earliest stage of an incident. The pre-hospital phase extends from the occurrence of an emergency until the patient reaches a health facility and is a critical period for maintaining vital functions and preventing complications. Pre-hospital nursing care includes initial assessment, vital signs monitoring, assessment of consciousness, airway and breathing management, and other interventions according to the patient's condition (Fauji & Ismunandar, 2019).

The need for ambulance-based emergency services is important in Indonesia. The Statistics of Land Transportation 2024 reported 150,906 traffic accidents in 2024 with 227,435 casualties, illustrating the continuing need for rapid and appropriate emergency response. Sidoarjo Regency, with high population density and traffic

mobility, also faces trauma emergencies as well as non-trauma medical emergencies.

PMI Sidoarjo Regency provides ambulance services to support patients before arrival at hospital. The service is not limited to evacuation and transportation; ambulance personnel also perform interventions such as vital signs assessment, observation, oxygen administration, wound care, bleeding control, splinting, neck collar application, and other interventions according to patient needs. These actions are important for maintaining patient stability during evacuation and transport.

Previous studies have often focused on clinical outcomes, emergency medical service response time, or ambulance personnel competence rather than describing the actual nursing interventions documented in ambulance registers. Therefore, a systematic description of pre-hospital nursing interventions in trauma and non-trauma cases is needed. Such information can support evaluation of ambulance service quality and the appropriateness of interventions to patient needs.

The aim of this study was to describe pre-hospital nursing interventions in trauma and non-trauma cases at PMI Ambulance Services of Sidoarjo Regency based on ambulance service registry data.

METHOD

This study used a quantitative descriptive design with a retrospective approach. The population consisted of all patients who received ambulance services from PMI Sidoarjo Regency during 2022–2024, totaling 103 patients. Total sampling was used, so all 103 patient records were included. Data were obtained from the ambulance service registry after research permission was obtained from PMI Sidoarjo Regency. The variables described were case type, response time, Glasgow Coma Scale (GCS), blood pressure, pulse rate, respiratory rate, oxygen saturation (SpO_2), and pre-hospital nursing interventions. Data processing included editing, coding, data entry, and cleaning. Descriptive analysis was then performed using frequency and percentage distributions. Because the study was descriptive, no inferential relationship or causal analysis was performed.

RESULTS

Among 103 ambulance service records, 72 patients (69.9%) had trauma cases and 31 (30.1%) had non-trauma cases. Response time was categorized as fast (≤15 minutes) in 70 services (68.0%) and slow (>15 minutes) in 33 services (32.0%). Most patients were classified as Compos Mentis based on GCS (80; 77.7%). Blood pressure was categorized as abnormal in 63 patients (61.2%) and normal in 40 (38.8%). Most patients had normal pulse rate (88; 85.4%), normal respiratory rate (89; 86.4%), and normal SpO_2 (92; 89.3%).

Table 1. Characteristics of Patients Receiving Ambulance Services (n=103)

Variable	Frequency (f)	Percentage (%)
Trauma case	72	69.9
Non-trauma case	31	30.1
Fast response time (≤15 min)	70	68.0
Slow response time (>15 min)	33	32.0
Compos Mentis (GCS 15)	80	77.7
Severe head injury (GCS 3–8)	14	13.6
Abnormal blood pressure	63	61.2
Normal pulse rate	88	85.4
Normal respiratory rate	89	86.4
Normal SpO_2 (95–100%)	92	89.3

Note: Categories shown are those used in the study's data analysis.

Table 2. Pre-Hospital Nursing Interventions by Case Type

Intervention	Trauma n (%)	Non-trauma n (%)	Total n (%)
Neck collar	9 (12.5)	0 (0)	9 (8.7)
Wound care	59 (81.9)	2 (6.5)	61 (59.2)
Splinting	15 (20.8)	1 (3.2)	16 (15.5)
Oxygen administration	11 (15.3)	15 (48.4)	26 (25.2)
Pain-relief spray	25 (34.7)	1 (3.2)	26 (25.2)
Vital signs assessment	72 (100)	31 (100)	103 (100)
Bleeding control	23 (31.9)	0 (0)	23 (22.3)
Observation	17 (23.6)	25 (80.6)	42 (40.8)
Random blood glucose	0 (0)	2 (6.5)	2 (1.9)
Evacuation	51 (70.8)	30 (96.8)	81 (78.6)

DISCUSSION

Case characteristics. The distribution of cases showed that trauma accounted for 72 patients (69.9%), while non-trauma accounted for 31 patients (30.1%). The larger proportion of trauma cases provides an important context for the types of interventions documented in the ambulance registry. Trauma may require immediate measures directed at injury control and stabilization during transport. The finding is consistent with Su et al. (2024), who described trauma as an important component of emergency care demand. In the present study, the case distribution is descriptive and does not establish the causes of the higher proportion of trauma cases.

Response time. A fast response time of ≤15 minutes was documented in 70 services (68.0%), whereas 33 services (32.0%) were categorized as slow. Response time is an important part of pre-hospital emergency service performance because it determines how quickly initial assessment and care can begin. Cabral et al. (2018) identified response time as a key indicator in emergency services, while Setyarini and Windarwati (2020) described factors that may contribute to variation in pre-hospital time intervals. The present result indicates that most ambulance responses fell within the fast category defined in this study, although a substantial proportion still exceeded 15 minutes.

Level of consciousness. Most patients were Compos Mentis with a GCS score of 15 (80; 77.7%). Four patients (3.9%) were categorized as mild head injury, five (4.9%) as moderate head injury, and 14 (13.6%) as severe head injury according to the categories used in the KTI. GCS is an important component of emergency assessment because changes in consciousness can indicate neurological deterioration and help determine the priority of care. Abdallah et al. (2020) showed the importance of consciousness scoring in assessing patients with reduced consciousness. In this study, the predominance of Compos Mentis indicates that most recorded patients had relatively preserved consciousness at assessment, but the presence of patients in lower GCS categories demonstrates the need for systematic neurological assessment.

Blood pressure. Blood pressure was categorized as abnormal in 63 patients (61.2%) and normal in 40 patients (38.8%). Blood pressure is one of the vital signs used to assess circulatory and hemodynamic status. In the pre-hospital setting, its interpretation should be considered together with other clinical findings rather than in isolation. Teuben et al. (2019) emphasized structured pre-hospital assessment in trauma care, while the KTI framework describes vital signs assessment as a basis for determining the appropriate nursing response. The proportion of abnormal blood pressure in this study indicates that not all patients had completely stable hemodynamic findings, supporting the

importance of continued monitoring during ambulance care.

Pulse rate. Most patients had a normal pulse rate (88; 85.4%), while 13 patients (12.6%) were categorized as tachycardia and two (1.9%) as bradycardia. Pulse rate provides information about cardiovascular function and circulatory response. Abnormal pulse findings may occur in association with pain, stress, blood loss, hypoxia, or medical conditions, but the present descriptive design does not allow those factors to be established as causes. The findings therefore support the practical importance of documenting pulse rate as part of the overall vital-sign assessment and interpreting it together with blood pressure, respiratory rate, oxygen saturation, and the patient's clinical presentation.

Respiratory rate. Respiratory rate was normal in 89 patients (86.4%), while 14 patients (13.6%) had an abnormal respiratory rate. Respiratory assessment is essential in the pre-hospital phase because changes in ventilation may be an early indication of clinical deterioration. Teuben et al. (2019) reported the importance of structured assessment in pre-hospital trauma care. In the present study, the predominance of normal respiratory rate suggests that most patients had respiratory rates within the category applied by the study, although the abnormal group still requires attention and monitoring according to the patient's overall condition.

Oxygen saturation. Most patients had normal oxygen saturation of 95–100% (92; 89.3%), while 11 patients (10.7%) had mild-to-moderate hypoxia in the category used by the study. SpO_2 provides a rapid indication of oxygenation status and is an important component of breathing assessment. Teuben et al. (2019) supports the importance of structured prehospital assessment for trauma patients. The presence of patients with lower SpO_2 values also provides a clinical context for the documented use of oxygen administration in the ambulance service. Because this study is descriptive, it describes the distribution of oxygen saturation and interventions without testing causal relationships.

Pre-hospital nursing interventions. Vital signs assessment was documented in all 103 patients (100%), followed by evacuation in 81 (78.6%), wound care in 61 (59.2%), observation in 42 (40.8%), oxygen administration and pain-relief spray in 26 patients each (25.2%), bleeding control in 23 (22.3%), splinting in 16 (15.5%), neck collar application in 9 (8.7%), and random blood glucose testing in two patients (1.9%). The high frequency of vital-sign assessment is consistent with its role as an initial assessment component for identifying patient condition and guiding subsequent care. The presence of multiple intervention types also shows that care was not limited to transportation alone. Teuben et al. (2019) reported improved pre-hospital care efficiency after implementation of PHTLS algorithms, supporting structured assessment and appropriate prioritization.

Trauma and non-trauma intervention patterns. The intervention pattern differed between trauma and non-trauma cases. In trauma cases, wound care was documented in 59 patients (81.9%), followed by pain-relief spray in 25 (34.7%), bleeding control in 23 (31.9%), observation in 17 (23.6%), splinting in 15 (20.8%), oxygen administration in 11 (15.3%), and neck collar application in 9 (12.5%). In non-trauma cases, evacuation was most frequent (30; 96.8%), followed by observation (25; 80.6%) and oxygen administration (15; 48.4%). These differences are consistent with the distinct clinical needs of injured and medical patients. The trauma pattern particularly reflects interventions directed toward injury management, while the non-trauma pattern is characterized more strongly by evacuation, observation, and oxygen administration. Su et al. (2024) and Teuben et al. (2019) support the importance of systematic and condition-adapted pre-hospital management. The present study adds a local description based on actual ambulance registry records.

CONCLUSION AND SUGGESTION

Pre-hospital ambulance services at PMI Sidoarjo Regency during 2022–2024 were dominated by trauma cases (69.9%). Most responses had a fast response time (68.0%), most patients were Compos Mentis (77.7%), and most had normal pulse rate, respiratory rate, and oxygen saturation. Vital signs assessment was performed in all patients (100%), followed by evacuation (78.6%), wound care (59.2%), and observation (40.8%). Trauma cases were dominated by wound care, whereas non-trauma cases were more frequently managed with evacuation and observation. Overall, the documented interventions were adjusted to patient clinical condition and needs.

PMI Ambulance Services of Sidoarjo Regency should maintain service quality and continue routine evaluation of response time, initial assessment, appropriateness of interventions, and completeness of ambulance documentation. Future studies may use larger samples, broader settings, and analytic designs to examine relationships between patient characteristics, response time, interventions, and service or patient outcomes.

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