

EVALUATING THE EFFECTIVENESS OF TRIAGE PROTOCOLS AT EMERGENCY DEPARTMENT OF DIVISIONAL HEAD QUARTER MIRPUR AJK

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Abstract

Background: Effective triage is essential for prioritising emergency patients according to clinical urgency and ensuring timely care. However, evidence regarding emergency department triage practices in Azad Jammu and Kashmir (AJK) remains limited.

Objective: To evaluate the effectiveness of existing triage protocols in the Emergency Department of Divisional Head Quarter Teaching Hospital, Mirpur, AJK.

Methods: A cross-sectional observational study was conducted over six months following approval of the study synopsis. A total of 235 patients aged ≥ 18 years presenting with acute medical or trauma-related conditions were included. Data were collected using a pre-approved structured questionnaire and analysed using IBM SPSS Statistics. Frequencies and percentages were used for descriptive analysis, while Pearson's chi-square test of independence was applied to assess associations between categorical variables. Statistical significance was set at $p < .05$.

Results: Males constituted 70.2% of participants, while 62.1% were aged 18–30 years. Road traffic accidents (26.4%), burns (25.1%), and falls (20.0%) were the most frequently reported emergencies. Most patients (83.0%) received initial triage within 15 minutes, and none waited more than 30 minutes. Red-category patients comprised 61.7% of the sample, followed by Green (26.0%), Yellow (11.5%), and Black (0.8%) categories. Significant associations were observed between waiting time and triage level ($\chi^2(3) = 56.90$, $p < .001$), pain severity and triage level ($\chi^2(4) = 12.95$, $p = .011$), staff behaviour and patient satisfaction ($\chi^2(6) = 6.97$, $p = .032$), and type of injury/emergency and triage level ($\chi^2(18) = 46.72$, $p = .002$).

Conclusion: The study found that triage assessment was generally performed within a short timeframe, with significant relationships between triage

category and selected clinical and service-related characteristics. The findings provide preliminary institution-specific evidence regarding emergency triage practices in AJK. Further multicentre studies using validated triage instruments and objective clinical outcomes are warranted to assess triage accuracy, reliability, and generalisability.

1. INTRODUCTION

Emergency departments (EDs) provide immediate assessment and management of patients with acute illness, trauma, and potentially life-threatening conditions. Increasing patient demand, limited beds, and constrained resources can contribute to overcrowding, prolonged waiting times, and difficulties in maintaining efficient patient flow (Anderson et al., 2006; Afilalo et al., 2004; Somma et al., 2015; Rowe et al., 2011). Because patients differ considerably in clinical severity and urgency, management solely according to order of arrival is inappropriate, making triage an essential component of emergency care (Moskop et al., 2009).

Triage is the rapid assessment and prioritisation of patients according to clinical urgency and severity, ensuring that those requiring immediate intervention receive timely care while less urgent cases are managed according to available resources (Göransson et al., 2005). Effective triage supports appropriate allocation of staff and treatment areas and requires healthcare professionals to rapidly recognise physiological abnormalities and determine appropriate treatment priority (Ajani et al., 2012; Considine et al., 2006). Adequate knowledge and competency among triage personnel are therefore essential for safe emergency care (College of Emergency Nursing Australasia [CENA], 2003).

The term triage originates from the French trier, meaning “to sort,” and its medical application developed during the Napoleonic Wars through Dominique Jean Larrey’s systematic prioritisation of wounded soldiers (Skandalakis et al., 2006; Ali et al., 2018). Triage subsequently evolved through the First and Second World Wars and became integrated into civilian emergency medicine (Iserson et al., 2007). Modern systems, including the Manchester Triage System, Emergency Severity Index, Canadian Triage and Acuity Scale, and

Simple Triage and Rapid Treatment, have further standardised emergency patient prioritisation (Steel & Robertson, 2006).

Contemporary triage prioritises patients according to clinical urgency rather than arrival order. Rapid assessment facilitates immediate management of life-threatening conditions while allowing less urgent patients to wait safely (Bermejo et al., 2013; Nakao et al., 2017). Importantly, severity refers to the seriousness of a condition, whereas urgency reflects the need for rapid intervention to prevent deterioration or death. Triage systems incorporate these considerations when assigning priority. Primary, secondary, and tertiary triage may occur at the scene, emergency department entry, and during definitive or critical care, respectively (Kennedy et al.; Iserson et al., 2007). Colour-coded systems commonly use red for immediate care, yellow for urgent care, and green for less urgent cases, with additional categories applied in specific circumstances.

Several approaches support rapid emergency assessment. The ABCDE approach—Airway, Breathing, Circulation, Disability, and Exposure—facilitates identification of life-threatening abnormalities (Thim et al., 2012). Simple triage and triage tags are particularly useful during mass-casualty incidents for rapid categorisation and prioritisation (Hanfling & Lang, 2006; Idoguchi et al., 2006; Yancey & O’Rourke, 2023). Advanced triage uses predefined protocols that may enable trained personnel to initiate selected investigations or interventions, with previous studies reporting potential improvements in waiting time, treatment initiation, comfort, and satisfaction (Butti et al., 2017; Cabilan & Boyde, 2017; Doetzel et al., 2016; Innes et al., 2017; Austin et al., 2020; Bittencourt et al., 2020).

Triage accuracy is important because inappropriate prioritisation may result in under-triage, where clinical urgency is underestimated

and appropriate care may be delayed, or over-triage, where patients receive a higher priority than clinically required, potentially increasing unnecessary resource utilisation (MacKenzie et al., 2006; Newgard et al., 2013). Reverse triage may also be used in mass-casualty situations to increase hospital capacity (Pollaris & Sabbe, 2016). Accurate triage therefore requires appropriate clinical judgement, trained personnel, and clear protocols, particularly when decisions must be made rapidly with limited information (Hashimoto et al., 2013; Orban et al., 2017; Patel et al., 2008).

Evaluation of triage performance may include time to triage, waiting time, triage priority, clinical presentation, pain severity, injury type, patient

flow, and patient satisfaction. These indicators provide information regarding the timeliness and organisation of emergency care and are particularly relevant in resource-constrained settings where high patient volumes and limited resources may increase delays. Despite the importance of triage, evidence evaluating emergency department triage practices in Azad Jammu and Kashmir (AJK) remains limited. Therefore, the present study aimed to evaluate triage practices at the Emergency Department of Divisional Head Quarter Teaching Hospital, Mirpur, AJK, focusing on triage timeliness, patient prioritisation, selected clinical and service-related factors, and patient satisfaction.

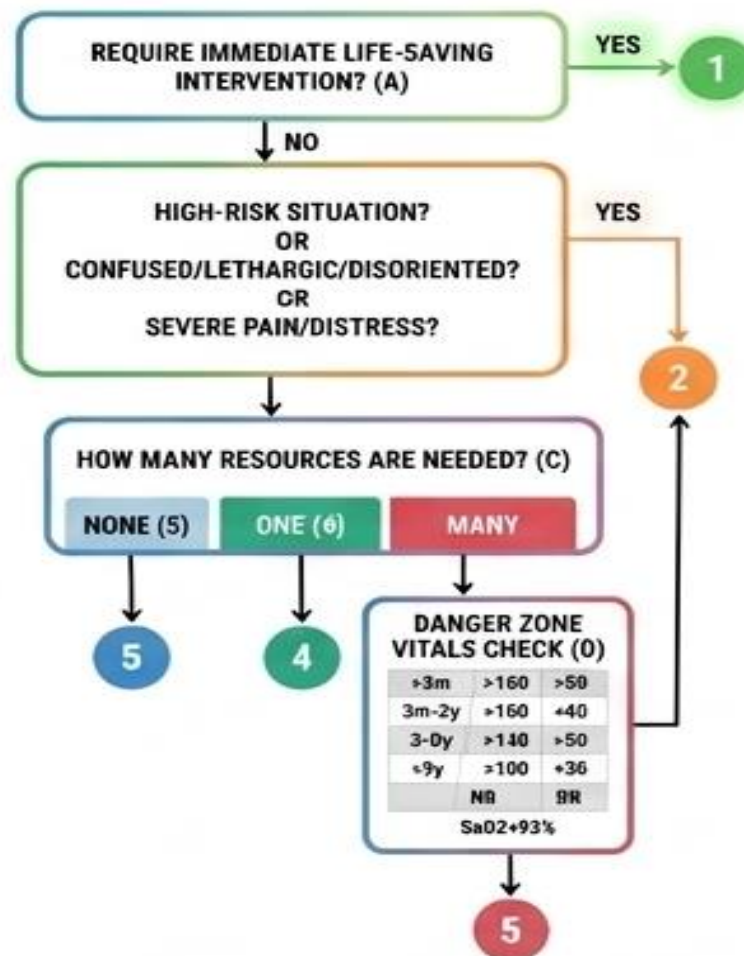


Figure 1. Emergency Severity Index (ESI) triage algorithm for prioritising emergency department patients.

2. CRITICAL ANALYSIS OF EVIDENCE ON EMERGENCY DEPARTMENT TRIAGE

Evidence from international studies indicates that structured triage can effectively differentiate patients according to clinical urgency and predict important outcomes, but its performance is highly dependent on the clinical and organisational context. Becker et al. (2015) demonstrated that higher triage priority was strongly associated with hospitalisation and mortality, supporting the predictive value of structured triage. However, Van der Linden et al. (2016) showed that this effectiveness may be compromised by ED crowding, with significant increases in delayed and missed triage during periods of high occupancy. Similarly, Butti et al. (2017) demonstrated that nurse-initiated triage could facilitate early analgesia and improve pain-related outcomes, suggesting that triage can function as more than a classification mechanism. Nevertheless, these findings largely originate from individual institutions and observational designs, limiting generalisability. The broader evidence base is also uneven; Hansoti et al. (2017) identified a predominance of observational research and limited attention to several important emergency-care populations, while Jenson et al. (2018) found that only a small proportion of validated triage studies in LMICs originated from low-income settings and none were conducted in rural hospitals. Dippenaar (2019) further highlighted that international triage systems have evolved according to differences in healthcare infrastructure, patient demand, and available resources, indicating that performance established in high-resource systems cannot necessarily be transferred directly to resource-constrained settings.

More recent evidence reinforces the need for context-specific evaluation rather than assuming that all triage models produce comparable outcomes. Mahajan et al. (2021) reported substantial staffing and preparedness limitations across emergency departments during the COVID-19 pandemic, demonstrating how organisational capacity can influence the functioning of emergency protocols. Mitchell et al.

(2025) similarly found that the WHO Interagency Integrated Triage Tool was feasible and acceptable in selected low-resource settings, but emphasised that robust evidence linking triage implementation with improved clinical outcomes remains limited. Emerging approaches also illustrate that efficiency must be considered alongside patient-centred outcomes. Balu et al. (2025) reported differences between nurse-initiated, Manchester, and digital triage approaches in waiting time, throughput, and satisfaction, whereas Taş et al. (2024) demonstrated that adding frailty assessment to conventional triage improved prediction of adverse outcomes among older adults. Collectively, these studies suggest that triage effectiveness cannot be judged solely by speed or patient throughput; accurate prioritisation, clinical risk prediction, resource availability, and patient experience must also be considered. Furthermore, evidence concerning advanced and nurse-initiated triage suggests potential improvements in waiting time, treatment initiation, and patient satisfaction, although differences in study design and healthcare context remain important limitations (Butti et al., 2017; Cabilan & Boyde, 2017; Doetzel et al., 2016; Innes et al., 2017; Austin et al., 2020; Bittencourt et al., 2020).

Evidence from Pakistan remains considerably more limited and is primarily institution- or condition-specific. Shabbir et al. (2021) reported 80.35% triage accuracy among patients with acute myocardial infarction, with approximately 19.6% being mis-triaged, demonstrating that timely assessment does not necessarily guarantee accurate prioritisation. Shaheen et al. (2023) similarly identified substantial variation in emergency waiting times and suggested that improved triage flow could enhance temporal efficiency. However, these studies do not provide comprehensive evidence regarding routine triage performance across different emergency presentations. Taken together with the international evidence, the literature demonstrates a clear need for locally generated data, particularly from resource-constrained and under-researched regions. There

is currently limited published evidence evaluating triage effectiveness in Azad Jammu and Kashmir, particularly at the Divisional Head Quarter Teaching Hospital, Mirpur. The present study therefore addresses an important evidence gap by examining triage timeliness, prioritisation, waiting time, pain severity, injury type, and patient satisfaction within this specific emergency-care setting.

AIMS AND OBJECTIVES

The present study aims to evaluate the effectiveness of triage protocols in the Emergency Department of Divisional Head Quarter Mirpur, Azad Jammu and Kashmir. Specifically, the study seeks to assess the accuracy of patient categorisation according to the existing triage protocols, evaluate the appropriateness of treatment and referral decisions based on assigned triage levels, determine the time required for triage assessment and patient prioritisation, and identify the factors affecting the implementation and overall performance of triage within the emergency department.

3. RESEARCH METHODOLOGY

This cross-sectional observational study was conducted in the Emergency Department of Divisional Head Quarter Teaching Hospital, Mirpur, Azad Jammu and Kashmir, over a period of 6 months following approval of the study synopsis and ethical clearance, with the aim of evaluating existing triage practices with respect to patient categorisation, treatment and referral decisions, triage assessment time, patient prioritisation, and factors affecting triage implementation and performance. A total of 235 participants were recruited through a sample-size estimation procedure. Eligible participants included male and female patients aged 18 years and above who presented to the Emergency Department with acute medical or trauma-related conditions requiring triage assessment and who provided written informed consent. Unconscious patients, patients deceased on arrival, patients referred from other hospitals after receiving initial emergency care, patients who left against medical

advice before triage, and those with incomplete or missing records were excluded. Data were collected prospectively using a pre-approved structured, self-administered questionnaire, which recorded demographic characteristics, including gender and age; time of arrival; waiting time before initial triage; type of injury or emergency; pain severity; pre-existing medical conditions; triage category; staff behaviour; and satisfaction with triage treatment. Pain severity was assessed using a 1-10 pain scale and categorised as low (1-3), moderate (4-7), and high (8-10), while triage categories were recorded according to the existing departmental classification as Green, Yellow, Red, and Black. Waiting time before initial triage was recorded as ≤ 15 minutes, 16-30 minutes, and > 30 minutes. Participants were informed about the purpose and procedures of the study, and written informed consent was obtained before data collection. Participation was voluntary, with no financial payment or special benefit provided, and refusal to participate did not affect access to emergency care. Ethical approval was obtained from the Ethical Committee of Divisional Head Quarter Teaching Hospital, Mirpur, Azad Jammu and Kashmir. Participant confidentiality was maintained throughout the study, with personal identifiers excluded from the research dataset and access to study records restricted to authorised research personnel. Data were entered, coded, checked for completeness, and analysed using IBM SPSS Statistics. Categorical variables were summarised using frequencies and percentages (n, %). The Pearson chi-square (χ^2) test of independence was used to assess associations between categorical variables, including waiting time and triage level, pain severity and triage level, staff behaviour and patient satisfaction, and type of injury/emergency and triage level. Statistical significance was considered at a two-sided $p < .05$. Data were entered, coded, and analysed using IBM SPSS Statistics. Descriptive statistics, including frequencies and percentages, were used to summarise categorical variables. The Pearson chi-square (χ^2) test of independence was used to determine associations between categorical variables, including waiting time and triage level,

pain severity and triage level, staff behaviour and patient satisfaction, and type of injury/emergency and triage level. A two-sided $p < .05$ was considered statistically significant.

4. RESULTS

In table 1, Among the 235 participants, males constituted the majority of the study population (70.2%), whereas females accounted for 29.8%. The largest proportion of participants was aged 18–30 years (62.1%), followed by those younger than 18 years (24.3%). Participants aged 31–45 years and 46–60 years represented 9.4% and 4.3% of the sample, respectively. Regarding the timing of emergency department presentation, most participants arrived during the morning (69.4%), while 30.6% presented during the evening. Overall, the sample was predominantly composed of younger adults and male patients, with a greater proportion of emergency presentations occurring during morning hours. These findings describe the characteristics of the study population and the observed pattern of emergency department attendance; however, they should not be interpreted as evidence that male or younger patients inherently experience more emergencies, as attendance patterns may also be influenced by referral practices, healthcare-seeking behaviour, occupational exposure, accessibility, and service utilisation patterns

As shown in Figure 2, road traffic accidents were the most frequently reported type of emergency, accounting for 26.4% of cases, followed by burn injuries (25.1%) and fall-related injuries (20.0%). Fractures/dislocations, head injuries, and cuts/open wounds accounted for 10.2%, 9.4%, and 8.9% of presentations, respectively. No cases related to assault were recorded during the study period. Overall, the distribution indicates that trauma-related presentations constituted a substantial proportion of emergency department attendance, with road traffic accidents, burns, and falls representing the most frequently observed categories. These findings provide important context for interpreting triage workload and prioritisation within the emergency department, as different injury types may require different

levels of urgency, assessment, and resource utilisation.

As presented in Figure 3, the majority of patients (83.0%) received their initial triage assessment within 15 minutes of arrival, while 17.0% were assessed within 16–30 minutes. No participant experienced a waiting time exceeding 30 minutes before initial triage. These findings demonstrate that initial triage assessment generally occurred within a relatively short period after emergency department arrival. However, waiting time alone does not establish the overall effectiveness of the triage protocol, as effectiveness also depends on the accuracy of patient prioritisation, appropriateness of treatment and referral decisions, and the ability to identify clinically urgent cases.

As shown in Table 2, most participants reported high pain intensity (8–10), accounting for 69.8% of the sample, while 17.0% reported low pain and 13.2% reported moderate pain. Pre-existing medical conditions were reported by 13.6% of participants, whereas 86.4% reported no pre-existing condition. Regarding staff behaviour, 43.0% of participants rated staff behaviour as good, 37.0% as fair, 17.0% as excellent, and 3.0% as poor. For satisfaction with triage treatment, 60.0% of participants were satisfied, 10.2% were extremely satisfied, and 29.8% reported a neutral response; no participants reported dissatisfaction. Overall, the findings demonstrate a high prevalence of severe self-reported pain alongside predominantly positive ratings of staff behaviour and triage treatment. However, these descriptive findings should be interpreted independently of triage effectiveness, as patient satisfaction and staff behaviour ratings do not directly establish the accuracy or clinical appropriateness of triage decisions.

Figure 4 illustrates the distribution of patients according to triage category. The Red category comprised the largest proportion of patients (61.7%, $n = 145$), followed by the Green category (26.0%, $n = 61$) and Yellow category (11.5%, $n = 27$). Two patients (0.8%) were classified as Black. The predominance of Red-category presentations indicates that a substantial proportion of patients

attending the emergency department were assigned the highest-priority triage level, while the presence of Green-category patients demonstrates that the department also managed a considerable number of lower-acuity presentations. This distribution highlights the need for timely differentiation and prioritisation of patients according to clinical urgency to support appropriate allocation of emergency care resources.

The findings presented in Table 3 demonstrated a statistically significant association between waiting time and triage level ($\chi^2(3) = 56.90$, $p < .001$), indicating that waiting-time distribution differed significantly across triage categories. Most patients classified as Red were assessed within 15 minutes, whereas patients classified as Yellow and Green

constituted a larger proportion of those waiting 15–30 minutes. A significant association was also observed between pain severity and triage level ($\chi^2(4) = 12.95$, $p = .011$), with patients reporting high pain scores comprising the largest proportion of the Red category. Similarly, staff behaviour was significantly associated with patient satisfaction ($\chi^2(6) = 6.97$, $p = .032$), indicating differences in satisfaction responses across staff-behaviour ratings. Finally, type of injury/emergency was significantly associated with triage level ($\chi^2(18) = 46.72$, $p = .002$), with road traffic accidents, burns, and falls accounting for substantial proportions of Red-category presentations. Collectively, these findings indicate statistically significant associations between triage classification and selected clinical and service-related characteristics

Table 1 Sociodemographic Characteristics and Time of Emergency Department Arrival Among Study Participants (N = 235)

Characteristic	Category	n	%
Gender	Male	165	70.2
	Female	70	29.8
Age (years)	<18	57	24.3
	18–30	146	62.1
	31–45	22	9.4
	46–60	10	4.3
	61–70	6	2.6
Time of arrival	Morning	163	69.4
	Evening	72	30.6

Note. Percentages are based on the total study sample (N = 235).

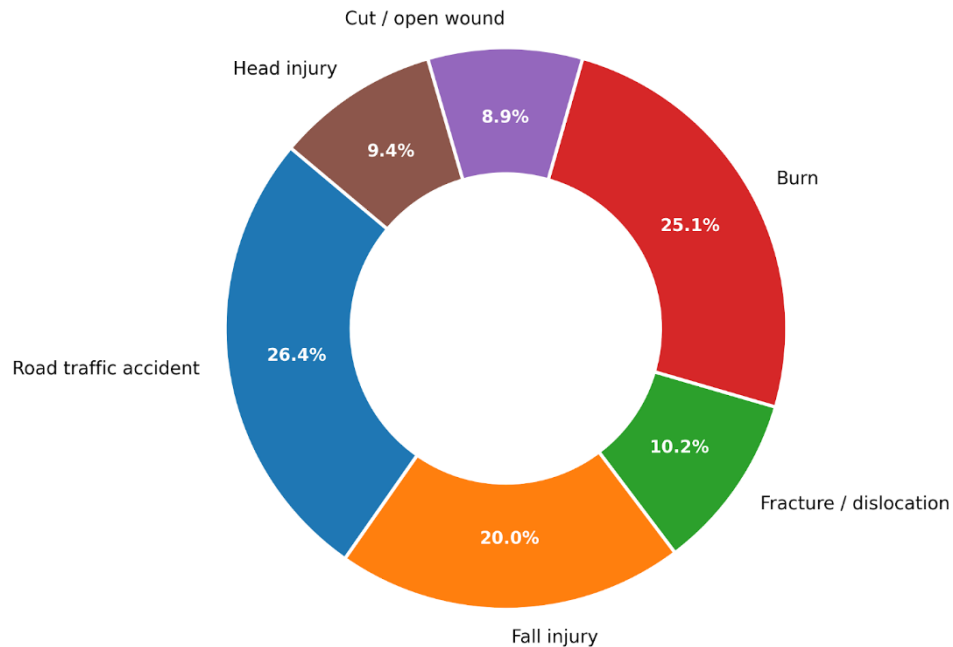


Figure 2: Distribution of Participants by Type of Injury / Emergency

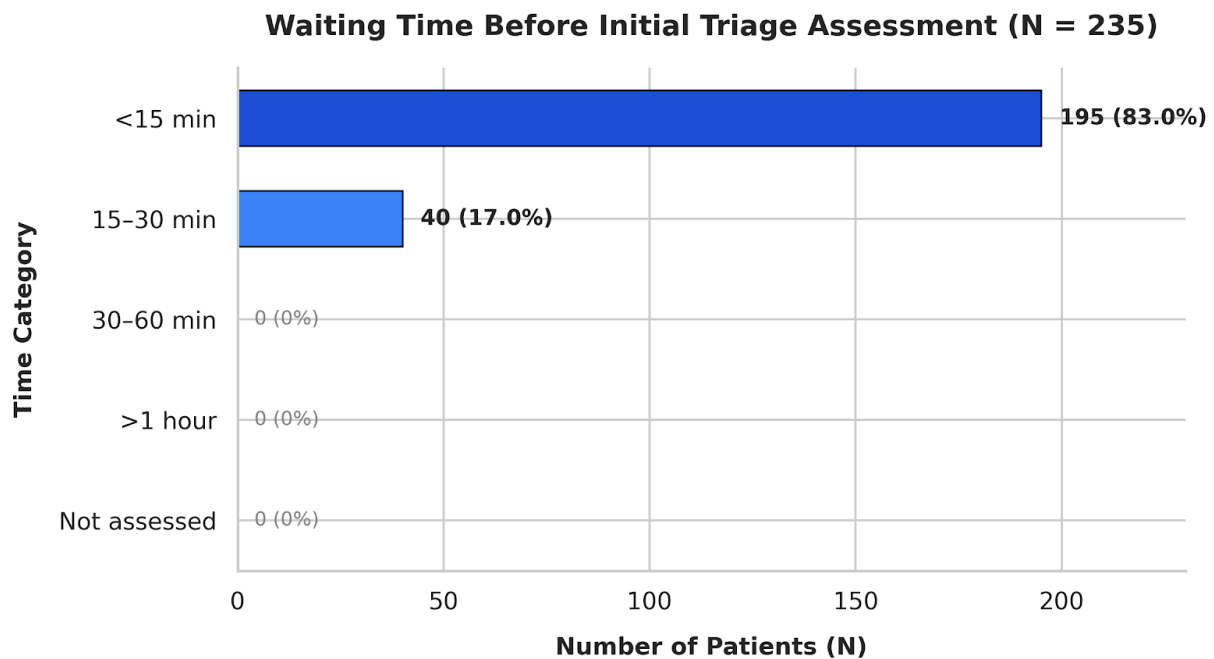


Figure 3: Waiting Time Before Initial Triage Assessment

Table 2. Clinical Characteristics and Patient-Reported Experiences During Triage (N = 235)

Variable	Category	n	%
Pain score	Low (1-3)	40	17.0
	Moderate (4-7)	31	13.2
	High (8-10)	164	69.8
Pre-existing medical condition	Yes	32	13.6
	No	203	86.4
	Prefer not to say	0	0.0
Staff behaviour rating	Poor	7	3.0
	Fair	87	37.0
	Good	101	43.0
	Excellent	40	17.0
Satisfaction with triage treatment	Extremely satisfied	24	10.2
	Satisfied	141	60.0
	Neutral	70	29.8
	Dissatisfied	0	0.0

Note. Percentages are based on the total study sample (N = 235)

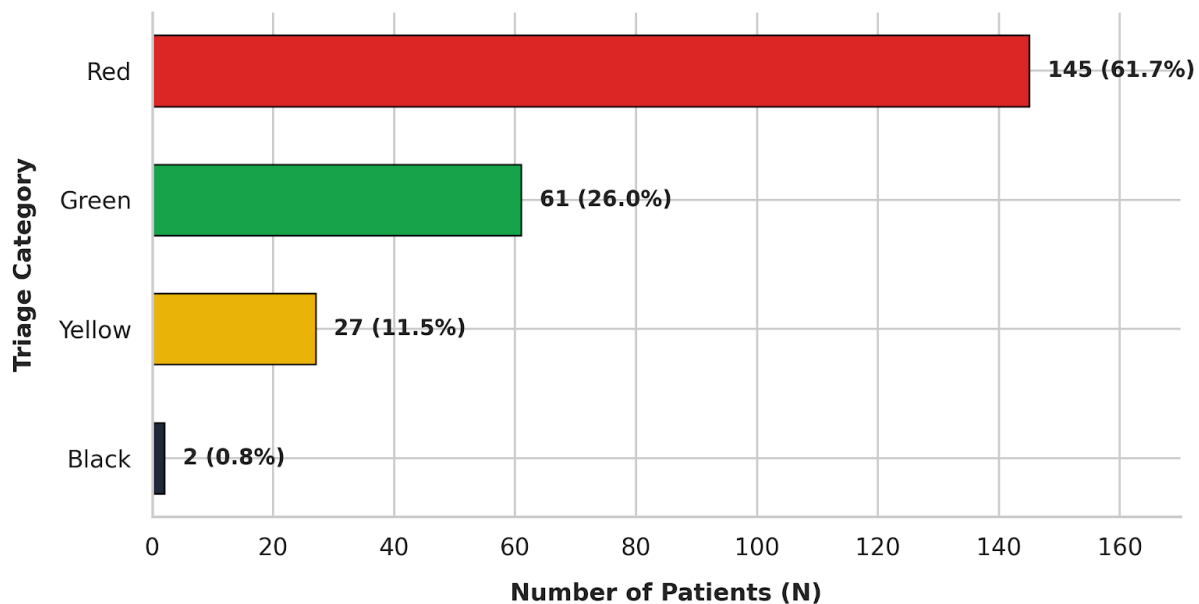


Figure 4: Distribution of Triage Levels Assigned to Emergency Department Patients (N = 235)

Table 3 Associations Between Triage Level and Waiting Time, Pain Severity, Staff Behaviour, and Type of Injury Among Emergency Department Patients (N = 235)

Variable	Category	Green, n (%)	Yellow, n (%)	Red, n (%)	Black, n (%)	Pearson χ^2 (df)	p
Waiting time	<15 minutes	54 (23.0)	7 (3.0)	124 (52.8)	1 (0.4)	56.90 (3)	<.001

	15–30 minutes	7 (3.0)	21 (8.9)	21 (8.9)	1 (0.4)		
Pain level	Low (1–3)	20 (8.5)	3 (1.3)	17 (7.2)	—	12.95 (4)	.011
	Moderate (4–7)	10 (4.3)	3 (1.3)	18 (7.7)	—		
	High (8–10)	31 (13.2)	23 (9.8)	110 (46.8)	—		
Staff behaviour	Poor	0 (0.0)	0 (0.0)	7 (3.0)	—	6.97 (6)	.032
	Fair	8 (3.4)	23 (9.8)	56 (23.8)	—		
	Good	11 (4.7)	35 (14.9)	55 (23.4)	—		
	Excellent	5 (2.1)	12 (5.1)	23 (9.8)	—		
Type of injury/emergency	Road traffic accident	21 (8.9)	6 (2.6)	34 (14.5)	1 (0.4)	46.72 (18)	.002
	Fall injury	9 (3.8)	5 (2.1)	33 (14.0)	0 (0.0)		
	Fracture/dislocation	6 (2.6)	1 (0.4)	16 (6.8)	1 (0.4)		
	Burn	14 (6.0)	8 (3.4)	37 (15.7)	0 (0.0)		
	Cut/open wound	4 (1.7)	4 (1.7)	13 (5.5)	0 (0.0)		
	Head injury	7 (3.0)	3 (1.3)	12 (5.1)	0 (0.0)		

Note. Pearson's chi-square test of independence was performed to assess associations between categorical variables. χ^2 = Pearson's chi-square statistic; df = degrees of freedom; $p < .05$ was considered statistically significant. Percentages are based on the total sample ($N = 235$).

5. DISCUSSION

5.1 Comparison With International Evidence

The present study provides evidence regarding the functioning of triage practices at Divisional Head Quarter Teaching Hospital, Mirpur, Azad Jammu and Kashmir, and its findings can be considered in relation to evidence from other healthcare settings. The predominance of male participants (70.2%) and younger adults, particularly those aged 18–30 years (62.1%), is consistent with the trauma-oriented profile frequently described in emergency-care settings. Becker et al. (2015) reported that higher triage priority was associated with hospitalisation and mortality, particularly among patients presenting with greater clinical

severity. Similarly, Jensen et al. (2018) and Dippenaar (2019) highlighted the influence of injury patterns, healthcare utilisation, and contextual characteristics on emergency department populations. However, the higher proportion of males and younger patients in the present study should not be interpreted as evidence that these groups inherently experience more emergencies, because emergency attendance may also be influenced by occupational exposure, injury patterns, referral pathways, healthcare-seeking behaviour, and the demographic structure of the population served.

The predominance of road traffic accidents, burns, and falls in the present study further

demonstrates the substantial contribution of trauma-related presentations to emergency department workload. This finding is broadly consistent with evidence from low- and middle-income settings, where trauma represents an important component of emergency care demand (Hansoti et al., 2017; Jensen et al., 2018). The high proportion of patients assigned to the Red triage category also indicates that a considerable proportion of presentations were classified as high priority. Becker et al. (2015) demonstrated that higher triage priority was associated with clinically important outcomes, supporting the relevance of prioritisation according to acuity. Nevertheless, the present study cannot independently establish whether the assigned triage categories were clinically accurate because validation against an external reference standard, such as subsequent diagnosis, resource utilisation, admission, or mortality, was not reported.

Timeliness of initial triage was another important finding. In the present study, 83.0% of patients were assessed within 15 minutes and all recorded assessments occurred within 30 minutes. This contrasts with findings from Van der Linden et al. (2016), who reported that emergency department crowding was associated with delayed and missed triage. The absence of waiting times exceeding 30 minutes in the present setting may indicate effective organisation of the initial triage process; however, this interpretation should be considered within the specific patient volume, staffing pattern, and observation period of the study. Balu et al. (2025) similarly reported differences in waiting time and patient flow according to triage approaches, highlighting the importance of organisational factors in determining triage performance. Thus, waiting time should be interpreted alongside accuracy, prioritisation, clinical outcomes, and available resources rather than as an isolated measure of effectiveness.

Pain severity was also associated with triage level in the present study, with patients reporting high pain scores representing the largest proportion of the Red category. This finding is compatible with the role of pain assessment as one component of emergency assessment and prioritisation. Butti et

al. (2017) reported that nurse-initiated triage incorporating pain assessment could facilitate earlier analgesic management and improve pain-related outcomes. However, pain intensity should not be considered synonymous with overall clinical acuity, as severe pain can occur in conditions with different levels of physiological instability. Therefore, the observed association in the present study suggests that pain was related to triage categorisation but does not, by itself, establish the appropriateness of individual triage decisions.

Patient-reported experiences provide an additional dimension of triage performance. In the present study, staff behaviour was significantly associated with satisfaction with triage treatment ($\chi^2(6) = 6.97, p = .032$), with positive staff-behaviour ratings occurring alongside higher satisfaction responses. This is consistent with evidence emphasising the importance of communication and patient-centred interaction during emergency care (Butti et al., 2017). Nevertheless, satisfaction is influenced by multiple factors, including waiting time, communication, expectations, treatment, and the overall emergency department environment. Therefore, the absence of reported dissatisfaction should be interpreted as a patient-reported outcome rather than direct evidence that the triage protocol itself was clinically effective.

5.2 Comparison With National Evidence

The findings of the present study can also be compared with the relatively limited Pakistani evidence on emergency department triage. Shabbir et al. (2021), in patients with acute myocardial infarction, reported a substantial proportion of mis-triage, demonstrating the challenges associated with accurate prioritisation in time-critical emergency conditions. In contrast, the present study found that 83.0% of patients underwent initial triage within 15 minutes and none waited more than 30 minutes. This difference may reflect variations in patient population, clinical presentation, hospital organisation, staffing, triage procedures, and study methodology. Importantly, the two findings are not directly comparable because the present study

assessed the timing of initial triage across a broader emergency population, whereas Shabbir et al. (2021) focused on patients with acute myocardial infarction.

Similarly, Shaheen et al. (2023) reported prolonged emergency department waiting times in a Pakistani setting, whereas the present study identified considerably shorter waiting times before initial triage. These differences highlight the importance of institutional and contextual factors in emergency department performance. Rather than indicating that one setting is universally more efficient than another, the findings suggest that staffing arrangements, patient flow, workload, infrastructure, referral patterns, and implementation of triage procedures may influence observed waiting times.

The present study is particularly relevant because evidence concerning emergency triage in Azad Jammu and Kashmir remains limited. The findings provide preliminary local data on triage timing, triage categorisation, pain severity, injury patterns, staff behaviour, and patient satisfaction at Divisional Head Quarter Teaching Hospital, Mirpur. However, the results should be regarded as institution-specific baseline evidence rather than being generalised to all hospitals in Azad Jammu and Kashmir or Pakistan. Further multicentre studies using validated triage instruments, larger samples, and objective clinical outcomes are required to determine the accuracy and reproducibility of triage practices across different Pakistani healthcare settings.

6 CONCLUSION

This study evaluated triage practices at Divisional Head Quarter Teaching Hospital, Mirpur, Azad Jammu and Kashmir. Most patients received initial triage within 15 minutes, and significant associations were observed between triage level and waiting time, pain severity, and type of injury/emergency. Staff behaviour was also significantly associated with patient satisfaction. These findings indicate that triage categorisation and patient flow were closely related to important clinical and service characteristics. However, the findings are specific to the study setting and

should be interpreted cautiously because triage accuracy was not validated against an independent clinical standard.

7 LIMITATIONS

The study was conducted at a single hospital, limiting generalisability. Its cross-sectional design prevented assessment of long-term outcomes such as mortality, morbidity, and hospital length of stay. Pain and satisfaction were self-reported and may have been influenced by individual perceptions. Additionally, inter-rater reliability and triage accuracy against an external clinical reference standard were not assessed.

8 RECOMMENDATIONS

Regular training and refresher sessions should be provided to triage staff, with standardised approaches for patient prioritisation and pain assessment. Routine audits of triage waiting times and category allocation should be conducted. Development of standardised triage guidelines for Pakistani emergency departments is recommended. Future research should use multicentre prospective designs, validated triage tools, inter-rater reliability assessment, and objective clinical outcomes such as mortality, admission, and hospital length of stay.

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