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FROM TRIAGE TO TURNAWAY: PERCEIVED EMERGENCY DEPARTMENT OVERCROWDING AS A MEDIATOR BETWEEN HIGH-PRIORITY NON-ADMISSION AND PATIENTS' INTENTION TO REVISIT THE HOSPITAL

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Abstract

Background: *Emergency department (ED) overcrowding is a persistent challenge that can influence patients' perceptions of healthcare quality, waiting experiences, and future preferences regarding healthcare providers. However, limited attention has been given to how patients experiencing high-priority non-admission interpret overcrowding and whether this perception is associated with their intention to revisit the same hospital. This study examined whether perceived ED overcrowding mediated the relationship between high-priority non-admission and patient revisit intention.*

Methods: *A quantitative, cross-sectional study was conducted among adult patients attending selected emergency departments in Karachi, Pakistan. Participants who received a relatively high-priority triage classification but were not admitted to an inpatient bed were included. Data were collected using a structured questionnaire assessing high-priority non-admission, perceived ED overcrowding, revisit intention, waiting time, and demographic characteristics. Age, gender, education, and waiting time were considered covariates. Data were analyzed using descriptive statistics, Spearman correlation, multiple regression, and mediation analysis with 5,000 bootstrap samples.*

Results: *High-priority non-admission demonstrated a strong positive association with perceived ED overcrowding (ρ = .738, p < .001), while perceived overcrowding was strongly associated with revisit intention (ρ = .742, p < .001). High-priority non-admission was also significantly associated with revisit intention (ρ = .722, p < .001). In the adjusted regression model, high-priority non-admission significantly predicted perceived overcrowding (B = 0.732, p < .001). Both high-priority non-admission (B = 0.272, p < .001) and perceived overcrowding (B = 0.586, p < .001) independently predicted revisit intention. Mediation analysis identified a significant indirect effect through perceived overcrowding (B = 0.429; 95% bootstrap CI: 0.306–0.577), while the direct effect remained significant, indicating partial mediation.*

Conclusion: *The findings suggest that perceived ED overcrowding may represent*

an important pathway linking high-priority non-admission experiences with patients' intention to revisit the same hospital. The results emphasize the importance of patient flow, capacity management, waiting-time reduction, and clear communication surrounding admission and discharge decisions. Because the study was cross-sectional and measured revisit intention rather than actual return visits, causal conclusions cannot be established. Longitudinal research should examine whether these intentions subsequently translate into actual healthcare utilization.

INTRODUCTION

Emergency departments (EDs) represent one of the most important access points to acute healthcare, particularly in urban health systems where patients frequently seek emergency services for conditions that range from minor illness to life-threatening disease. The contemporary ED, however, operates under persistent pressure generated by increasing patient volumes, limited staffing, restricted inpatient bed availability, prolonged treatment processes, diagnostic delays, and difficulties transferring patients through the hospital. Consequently, emergency department overcrowding has become a major organizational and patient-safety challenge. Recent evidence continues to demonstrate that crowding is associated with impaired patient flow, prolonged waiting and treatment times, increased length of stay, and deterioration in several indicators of care quality (Darraj et al., 2023; Eidstø et al., 2024; Hsuan et al., 2023; Youssef et al., 2024).

The problem is particularly important because ED crowding is not solely an operational phenomenon. Patients experience crowding through visible queues, delays in assessment, prolonged waiting for investigations, limited availability of treatment spaces, difficulty communicating with healthcare personnel, lack of privacy, and uncertainty regarding what will happen next. Thus, objective measures such as occupancy rate, patient census, boarding burden, and length of stay may not fully capture the patient's experience of being treated in an overcrowded environment. Research has increasingly demonstrated that the subjective experience of crowding can influence patients' perceptions of care and their overall healthcare experience. King et al. (2021), for example, found that greater ED overcrowding was associated with lower patient satisfaction, while Berlyand et al. (2023) reported that discharged patients were more likely to report a negative experience when they arrived during periods of greater ED crowding.

This distinction between objective crowding and perceived overcrowding is particularly relevant to the present study. Objective crowding describes the measurable relationship between patient demand and available ED resources, whereas perceived overcrowding reflects how patients interpret and experience the environment around them. Two patients exposed to similar operational conditions may therefore report different levels of crowding because their perceptions are shaped by waiting time, communication, expectations, prior healthcare experiences, perceived urgency, physical congestion, and the clarity of information provided by staff. Evidence has shown that crowding can influence interpersonal aspects of emergency care as well as operational outcomes. In patients presenting with suspected acute coronary syndrome, higher crowding at arrival was associated with poorer perceptions of interpersonal care, including communication and patient-centred interaction (2022).

Triage represents another critical component of this experience. Triage systems are designed to prioritize patients according to clinical urgency and thereby allocate limited emergency resources according to need. A high-priority triage classification communicates to the patient, either directly or indirectly, that the clinical situation warrants relatively prompt attention. Importantly, however, triage priority does not automatically imply hospital admission. Patients can receive an urgent or high-priority classification, undergo assessment and treatment, and subsequently be

discharged because admission is not clinically indicated. Therefore, non-admission itself should not be interpreted as evidence of poor-quality or inappropriate clinical decision-making. This distinction is fundamental to the present research because the study is concerned with how patients experience high-priority non-admission, rather than whether clinicians made an incorrect admission decision.

Evidence also suggests that triage acuity is associated with subsequent healthcare trajectories. Recent research examining the Canadian Triage and Acuity Scale (CTAS) found substantial differences in discharge and return patterns across triage categories. High-acuity patients were more likely to require admission when they subsequently returned to the ED, demonstrating that triage classification can provide meaningful information about subsequent healthcare utilization without implying that every high-acuity patient should have been admitted during the initial encounter (2025). Similarly, research on rapid triage has demonstrated that high-priority classifications are useful for identifying patients requiring expedited emergency care, although triage systems differ in their ability to predict hospitalization (Moura & Nogueira, 2020).

The intersection between triage priority and non-admission becomes particularly interesting in an overcrowded ED. A patient who is classified as relatively high priority may reasonably expect rapid attention and may interpret subsequent delays, prolonged waiting, or discharge without admission differently from a patient initially categorized as lower priority. If the ED is visibly crowded, the patient may attribute the inability to secure an inpatient bed, delayed reassessment, or extended waiting to a broader shortage of hospital capacity. Consequently, the psychological meaning of non-admission may be shaped not only by the clinical explanation provided by the physician but also by the patient's perception of the overall environment.

This issue is important because hospital admission decisions occur within the broader context of ED capacity. Crowding can affect admission decisions themselves. Ouyang et al. (2022) demonstrated that ED census and physician workload were associated with admission probability, while boarding burden was associated with subsequent revisit probability among discharged patients. These findings suggest that capacity constraints may influence the pathway between initial ED assessment, disposition, and later healthcare utilization. More recent evidence similarly indicates that hospital-wide patient flow, bed availability, and boarding are important contributors to ED crowding and that interventions addressing admission and bed-assignment processes can substantially reduce ED length of stay (Youssef et al., 2024).

Patient experience is therefore a potentially important mechanism linking operational conditions to future behavioural intentions. Patients do not evaluate an ED solely on the basis of diagnosis and treatment. Their evaluations may also include waiting time, communication, staff responsiveness, privacy, perceived organization, explanations about treatment and disposition, and confidence that their needs were taken seriously. Studies of ED patient experience have repeatedly identified overcrowding, waiting, communication problems, and privacy as important dimensions of the emergency-care experience (Karalius et al., 2021; Saleem et al., 2022). Communication is especially important when patients receive decisions that may not correspond with their expectations. Evidence from emergency settings indicates that patients value explanations, respectful communication, involvement in treatment decisions, and reassurance regarding their condition (Alotaibi et al., 2022).

The consequences of crowding extend beyond satisfaction. A systematic review by Darraj et al. (2023) found that ED overcrowding was associated with delays in treatment initiation, particularly in time-sensitive conditions. Other contemporary evidence has associated crowding with adverse outcomes, increased length of stay, and deterioration in healthcare-system performance (Eidstø et al., 2024; Hsuan et al., 2023). Although the strength and direction of some associations vary between studies and settings, the overall evidence supports the

proposition that crowding is not merely an inconvenience but a multidimensional healthcare-quality problem.

Importantly, however, the relationship between crowding and actual return visits is not straightforward. Evidence has produced mixed findings depending on how crowding is defined, when it is measured, and which patient population is studied. One large observational study reported that specific crowding indicators, particularly boarding burden, were associated with increased 72-hour ED returns (2020). Ouyang et al. (2022) similarly identified an association between boarding and seven-day revisit probability. Conversely, differences across studies indicate that return visits are influenced by numerous clinical and contextual factors and should not automatically be interpreted as evidence of poor ED performance.

The present study therefore deliberately examines patient intention to revisit rather than actual return visits. Revisit intention is a behavioural intention reflecting whether a patient would be willing to use the same hospital again if healthcare were required. It is conceptually distinct from an objectively recorded return visit because an actual revisit may be influenced by disease progression, geographical accessibility, insurance arrangements, referral patterns, availability of alternative hospitals, and the severity of subsequent illness. Conversely, intention captures the patient's evaluative response to the healthcare experience. Contemporary healthcare research has demonstrated that service quality, satisfaction, patient loyalty, and perceived healthcare experiences can influence patients' intention to return to the same healthcare organization (Aman-Ullah et al., 2023; Saadi & Junadi, 2024).

Evidence from Pakistan is particularly relevant. Aman-Ullah et al. (2023) found significant relationships among healthcare-related organizational factors, patient satisfaction, loyalty, and intention to revisit among patients in hospitals in Rawalpindi and Islamabad. More recently, research in Punjab reported that healthcare service quality and patient satisfaction were associated with patients' intention to revisit the same healthcare facilities (2024). International studies have likewise demonstrated relationships between perceived healthcare quality, patient satisfaction, and intention to revisit (2021–2024).

Nevertheless, an important gap remains. Existing research has predominantly examined revisit intention as an outcome of service quality, satisfaction, hospital image, loyalty, or corporate social responsibility. Comparatively little attention has been given to whether a patient's experience of high-priority non-admission influences revisit intention through perceived ED overcrowding. This represents an important conceptual gap because non-admission and overcrowding are not necessarily independent experiences. For a patient who has been assigned relatively high priority, the inability to obtain admission may be interpreted as a consequence of limited beds or an overloaded hospital, particularly when the ED environment visibly communicates scarcity and congestion.

The Karachi context makes this question especially relevant. A study conducted in a tertiary-care hospital in Karachi documented a substantial ED patient burden, reporting 13,434 adult ED visits during approximately three months and an average daily attendance of 141 patients. The investigators identified mismatches between patient flow, staffing, doctors, and available beds, while delays in investigations contributed to prolonged ED stays and overcrowding (Faridi et al., 2021). Patient-perception research from a tertiary-care ED in Karachi has also demonstrated that crowding can coexist with important concerns regarding privacy, confidentiality, and patient-provider interaction (Saleem et al., 2022). These findings provide a strong contextual basis for investigating how patients interpret emergency-care experiences in Karachi.

The logic of this model is that high-priority non-admission may create a salient experience of unmet expectations or uncertainty. When this experience occurs within an apparently overcrowded environment, patients may attribute their experience to system-level capacity constraints. This perception may subsequently

influence their willingness to seek care from the same hospital in the future. The proposed model does not assume that clinicians should have admitted the patient, nor does it suggest that non-admission represents clinical failure. Rather, it examines whether patients' interpretation of the process provides a behavioural pathway through which their disposition experience affects future hospital preference.

This distinction is important for hospital administrators. If perceived overcrowding mediates the relationship, interventions should not be restricted to increasing physical bed capacity. Hospitals may also improve the patient experience through better triage communication, transparent explanations regarding admission decisions, real-time information about expected waiting, improved patient flow, faster diagnostic processes, efficient bed allocation, and stronger coordination between ED and inpatient units. Contemporary evidence indicates that interventions directed at throughput and patient flow can improve important ED performance indicators, including time to provider, time to disposition, and patients leaving without being seen (Youssef et al., 2024).

Accordingly, the present study aimed to investigate whether perceived ED overcrowding mediated the relationship between high-priority non-admission and patients' intention to revisit the same hospital among adults attending selected hospitals in Karachi. By focusing on patient perception rather than judging clinical appropriateness, the study sought to provide a patient-centred explanation of how emergency disposition experiences may influence future healthcare-seeking intentions.

Methodology

A quantitative, analytical, cross-sectional study design was used to examine the proposed relationships among high-priority non-admission, perceived ED overcrowding, and patient revisit intention. The study was conducted among adult patients attending the emergency departments of selected tertiary-care hospitals in Karachi, Pakistan. The study setting was selected because Karachi EDs experience substantial patient volumes and documented operational pressures related to staffing, diagnostic delays, bed availability, and patient flow (Faridi et al., 2021).

The study population comprised adult patients aged 18 years or older who attended the selected EDs and had received a relatively high-priority triage classification but were ultimately not admitted to an inpatient bed. High-priority classification was operationalized according to the triage system used at the participating hospital. Because triage systems differ internationally, the study recorded the specific triage category rather than assuming that one international scale applied uniformly across all hospitals. This approach was consistent with evidence showing variation among ED triage systems and their relationship with admission and subsequent outcomes (Moura & Nogueira, 2020; 2025).

Patients were eligible when they were clinically stable at the time of questionnaire administration, had completed the ED assessment, understood the study information, and provided informed consent. Patients requiring immediate resuscitation, those with severe cognitive impairment preventing questionnaire completion, patients unable to communicate in the study language, and individuals who were admitted to an inpatient bed were excluded.

The sample size was calculated using the single-proportion formula:

$$n = \frac{Z^2 pq}{d^2}$$

A recent large ED study reported a 7.6% 72-hour return-visit rate among discharged patients, providing a relevant empirical estimate for ED revisit-related outcomes (Hyman et al., 2022). Using $p = 0.076$ gives an initial prevalence-based sample of approximately 108 participants. However, this figure was considered insufficient for the proposed mediation model, because mediation analysis requires adequate observations to estimate the direct and indirect paths reliably and to accommodate adjustment variables.

Therefore, a conservative prevalence of 50% was used for the primary sample-size determination because no established Karachi-specific

prevalence of *low revisit intention following high-priority non-admission* was available. With 95% confidence and 5% precision:

Accordingly, a minimum sample of 428 completed questionnaires was targeted. This approach was preferable to applying a finite population correction based on an assumed Karachi ED population, because the eligible population consisted specifically of high-priority, non-admitted adult patients in the participating hospitals rather than all residents of Karachi. The final recruitment target could subsequently be recalculated using the documented eligible ED population of the participating hospitals if verified hospital-specific attendance data became available.

Participants were recruited using consecutive sampling. Every eligible patient who met the inclusion criteria during the data-collection period was approached consecutively until the required sample size was achieved. This approach reduced investigator discretion in participant selection and was considered practical for an ED-based cross-sectional study.

Data were collected through a structured questionnaire comprising four sections: demographic characteristics; high-priority non-admission experience; perceived ED overcrowding; and patient revisit intention. Items measuring perceptions were scored using a Likert-type response scale. The questionnaire was reviewed for content validity by experts in emergency medicine, hospital administration, and health-services research and was pilot-tested before formal data collection.

Perceived overcrowding was measured from the patient's perspective, incorporating experiences such as excessive patient volume, congestion, waiting, limited treatment space, delays, and perceived shortage of staff or beds. Revisit intention measured the patient's willingness to return to the same hospital if healthcare was required in the future. The distinction between intention and actual revisit was maintained throughout the study.

Data were analyzed using IBM SPSS Statistics. Descriptive statistics were calculated for demographic and study variables. Means and standard deviations were reported for continuous variables, while frequencies and percentages were reported for categorical variables. Reliability of multi-item constructs was assessed using Cronbach's alpha.

Bivariate associations were examined using appropriate correlation and group-comparison tests. Multiple linear regression models were then used to assess the relationships between high-priority non-admission, perceived overcrowding, and revisit intention while adjusting for relevant demographic and clinical characteristics.

Mediation was examined using regression-based mediation analysis with bootstrapping, estimating the total, direct, and indirect effects. The indirect effect was considered statistically meaningful when its bias-corrected 95% bootstrap confidence interval did not include zero. This approach was selected because it directly estimates the indirect pathway rather than relying solely on the causal-steps approach.

Participation was voluntary, informed consent was obtained, and participants were informed that refusal would not affect their medical care. No identifying information was included in the analytical dataset, and completed questionnaires were handled confidentially.

Data Analysis and Discussion

Table 1. Demographic Characteristics of Respondents (N = 428)

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Female	233	54.4
	Male	195	45.6
Age	21–25 years	148	34.6
	26–30 years	153	35.7
	31–35 years	91	21.3
	36–40 years	25	5.8
	More than 40 years	11	2.6
Education	Intermediate	58	13.6
	Bachelor's	169	39.5
	Master's	184	43.0
	Any other	17	4.0
Total		**428**	**100.0**

Most respondents were female (54.4%), and the sample was predominantly young, with 70.3% aged 21–30 years. Educational attainment was high, as 82.5% held bachelors or master's degrees. These characteristics indicate a relatively young, well-educated cohort with adequate capacity to respond to perception-based questionnaire items.

Table 2. Spearman Correlations Among Main Study Variables

Variable	1	2	3	4
1. High-Priority Non-Admission	1.000			
2. Perceived ED Overcrowding	.738**	1.000		
3. Patient Revisit Intention	.722**	.742**	1.000	
4. Waiting Time	.026	.022	-.037	1.000

Note: p < .01 (two-tailed).

High-priority non-admission demonstrated a strong positive association with perceived ED overcrowding ($\rho = .738$, $p < .001$) and revisit intention ($\rho = .722$, $p < .001$). Perceived

overcrowding was also strongly related to revisit intention (ρ = .742, p < .001). Waiting time showed negligible associations with all three principal variables.

Table3. Multiple Regression Predicting Perceived ED Overcrowding

Predictor	B	SE	t	p
High-Priority Non-Admission	0.732	0.045	16.245	<.001
Age	-0.017	0.010	-1.684	.094
Gender	0.259	0.095	2.710	.007
Education	0.019	0.073	0.253	.800
Waiting Time	0.006	0.055	0.106	.915

Model: R^2 = .583; Adjusted R^2 = .573; F(5,194) = 54.33, p < .001.

The regression model explained 58.3% of the variance in perceived ED overcrowding. High-priority non-admission was a strong positive predictor of perceived overcrowding (B = 0.732, p < .001), while gender also showed a significant association. Age, education, and waiting time did not independently contribute significantly after adjustment for the other variables.

Table 4. Multiple Regression Predicting Patient Revisit Intention

Predictor	B	SE	t	p
High-Priority Non-Admission	0.272	0.066	4.149	<.001
Perceived ED Overcrowding	0.586	0.068	8.610	<.001
Age	0.001	0.010	0.145	.885
Gender	0.042	0.092	0.453	.651
Education	0.056	0.069	0.811	.419
Waiting Time	-0.022	0.053	-0.419	.676

Model: R^2 = .646; Adjusted R^2 = .634; F(6,193) = 58.57, p < .001.

The regression model explained 64.6% of the variance in patient revisit intention. Both high-priority non-admission (B = 0.272, p < .001) and perceived ED overcrowding (B = 0.586, p < .001) independently predicted revisit intention. None of the demographic variables or waiting time demonstrated statistically significant independent associations with revisit intention.

Table 5. Mediation Analysis of Perceived ED Overcrowding

Effect	B	Interpretation
Total effect (c)	0.701	High-priority non-admission → revisit intention
Path a	0.732	High-priority non-admission → perceived overcrowding
Path b	0.586	Perceived overcrowding → revisit intention
Direct effect (c′)	0.272	High-priority non-admission → revisit intention after mediator
Indirect effect (a × b)	0.429	High-priority non-admission → overcrowding → revisit intention
Bootstrap 95% CI	0.306 to 0.577	Does not include zero

Covariates: Age, gender, education, and waiting time.**Bootstrap samples:** 5,000.

The findings supported a statistically significant indirect pathway through perceived ED overcrowding. High-priority non-admission was strongly associated with perceived overcrowding, which was subsequently associated with revisit intention. The bootstrap confidence interval for the indirect effect excluded zero, supporting mediation. A significant direct effect remained, indicating partial mediation rather than complete mediation.

The present study demonstrated a clear relationship among high-priority non-admission, perceived emergency department (ED) overcrowding, and patient revisit intention. High-priority non-admission was strongly associated with perceived overcrowding ($\rho = .738$, $p < .001$), while perceived overcrowding was also strongly associated with revisit intention ($\rho = .742$, $p < .001$). These findings are consistent with previous evidence showing that ED crowding substantially shapes patients' experiences and perceptions of care. King et al. (2021) reported that greater ED overcrowding was associated with lower patient satisfaction, while Berlyand et al. (2023) similarly found that crowding negatively influenced the experiences of discharged patients. These findings support the interpretation that the circumstances surrounding ED disposition may influence how patients evaluate the hospital beyond the clinical decision itself.

The strong association between high-priority non-admission and perceived overcrowding may reflect patients' interpretation of limited hospital capacity. Ouyang et al. (2022) demonstrated that ED crowding can influence admission decisions and subsequent patient outcomes, highlighting the interaction between emergency demand and inpatient capacity. This is particularly relevant in Karachi, where Faridi et al. (2021) documented substantial ED workload and operational factors contributing to overcrowding. The present findings therefore extend earlier work by demonstrating that patients may perceive the consequences of capacity constraints even when non-admission does not necessarily represent inappropriate clinical management.

Perceived overcrowding also demonstrated a significant positive association with revisit intention. This finding is compatible with research linking healthcare experiences, satisfaction, and future utilization preferences (Aman-Ullah et al., 2023; Saadi & Junadi, 2024). Importantly, the current outcome was intention to revisit, rather than an actual return visit, making direct comparison with studies of ED re-attendance inappropriate.

The mediation analysis provided the principal contribution of this study. Perceived overcrowding significantly transmitted part of the association between high-priority non-admission and revisit intention (indirect effect = 0.429; 95% bootstrap CI: 0.306–0.577). The remaining direct effect indicates partial rather than complete mediation. Thus, the patient's disposition experience appears to influence revisit intention partly through perceptions of overcrowding. The findings reinforce the importance of patient flow, communication, and capacity management, consistent with evidence that improving ED throughput can enhance care delivery (Youssef et al., 2024). Alotaibi et al. (2022) and Saleem et al. (2022) further emphasize communication and patient-centred experiences as important components of emergency care. Overall, the findings suggest that hospitals should address not only physical overcrowding but also how capacity limitations and non-admission decisions are communicated and experienced by patients.

Conclusion

The present study provides evidence that the experience of high-priority non-admission is meaningfully associated with patients' perceptions of emergency department overcrowding and their intention to revisit the same hospital. The findings showed strong positive relationships between high-priority non-admission and perceived overcrowding, as well as between perceived overcrowding and revisit intention. Importantly, the mediation analysis demonstrated that perceived ED overcrowding significantly explained part of the relationship between high-priority non-admission and patients' intention to return. The persistence of a significant direct effect indicated partial mediation, suggesting that overcrowding

represents an important mechanism but does not fully account for the relationship.

These findings should not be interpreted as evidence that non-admission decisions were clinically inappropriate. Rather, they highlight the importance of understanding how patients interpret and experience the circumstances surrounding emergency disposition. When patients perceive congestion, limited capacity, prolonged delays, or difficulties in patient flow, their overall evaluation of the hospital may be influenced even when the underlying clinical decision is appropriate.

The findings have practical implications for hospital administrators and emergency-care managers. Improving patient flow, strengthening coordination between emergency and inpatient services, managing bed availability, reducing avoidable delays, and providing clear explanations regarding admission and discharge decisions may help improve patients' experiences. Communication should remain central to this process because patients require understandable information about their condition, treatment, expected waiting, and reasons for non-admission.

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