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Emergency Department Waiting Time, Communication, and Patient Perceptions of Care: A Cross- Sectional Study in a Lebanese Hospital

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Abstract

Background

Emergency department (ED) waiting time is an important component of patient experience and may influence perceptions of care quality and satisfaction. This study aimed to examine the associations between perceived ED waiting time, communication regarding expected waiting times, and patients' perceptions of care, satisfaction, and waiting-related concerns in a Lebanese hospital.

Methods

An analytical cross-sectional study was conducted among 288 conscious, clinically stable, non-critical patients attending the emergency department of Haykel Hospital, Lebanon. Data were collected using a structured questionnaire assessing perceived waiting time, communication regarding expected waiting times, perceived effects of waiting on satisfaction and care, complaint-related concerns, awareness of the right to refuse care because of unacceptable waiting time, and suggested improvement strategies. Descriptive statistics, Spearman's rank correlation, and binary logistic regression were performed using IBM SPSS Statistics version 27.0.1.

Results

Among participants, 146 (50.7%) reported receiving information regarding the expected waiting time. Patients who were informed about the expected waiting time reported more favorable waiting-time perceptions in the unadjusted analysis. After adjustment for sex and age, information about the expected waiting time was significantly associated with greater reported awareness of the right to refuse care because of unacceptable waiting time (aOR = 4.804, 95% CI: 2.807–8.221, $p < 0.001$). Longer perceived waiting time was significantly associated with greater perceived effects of waiting on satisfaction and care and with a higher perceived probability of complaint.

Conclusion

Longer perceived ED waiting time was associated with less favorable patient-reported perceptions of the effects of waiting on satisfaction and care and with greater complaint-related concerns. Clear communication regarding expected waiting times, together with strategies to improve patient flow, may contribute to a more patient-centered emergency care experience.

INTRODUCTION

Emergency departments (EDs) are a fundamental component of healthcare systems, providing rapid assessment, stabilization, and treatment for patients with acute illnesses and injuries. As one of the

principal entry points into hospitals, EDs are expected to deliver timely, safe, and high-quality care despite unpredictable patient volumes, increasing healthcare demand, and limited resources (Morley et al., 2018; Hoot & Aronsky, 2008).

Over recent decades, EDs worldwide have experienced increasing operational pressure due to rising patient attendance, population aging, the growing prevalence of chronic diseases, and persistent limitations in healthcare resources (Asplin et al., 2003; Morley et al., 2018). When patient demand exceeds the available human, physical, and organizational capacity, ED overcrowding occurs, creating substantial challenges for the delivery of timely and effective care (Hoot & Aronsky, 2008; Morley et al., 2018). ED overcrowding is a multifactorial phenomenon driven by increased patient arrivals, access block, inpatient bed shortages, insufficient staffing, delays in diagnostic and treatment processes, and inefficient patient flow (Asplin et al., 2003; Hoot & Aronsky, 2008). Collectively, these factors are associated with prolonged waiting times, delays in treatment, reduced operational efficiency, and poorer patient outcomes (Morley et al., 2018; Carter et al., 2014; Youssef et al., 2024, Pearce et al., 2024; Samadbeik et al., 2024; Darraj et al., 2023).

ED overcrowding and the resulting operational challenges contribute to prolonged waiting times, increased workload among healthcare professionals, communication difficulties, and reduced opportunities for individualized patient care (Oskvarek et al., 2026; Ahmed et al., 2026). During periods of high patient volume, these pressures may adversely affect care processes, operational efficiency, and the overall patient experience (Morley et al., 2018; Hoot & Aronsky, 2008). Prolonged waiting times are among the most visible consequences of ED overcrowding and are widely recognized as key determinants of patient satisfaction. Although triage systems prioritize patients according to the urgency of their clinical condition, prolonged waiting periods may lead to uncertainty, frustration, anxiety, and dissatisfaction with the overall care experience (Boudreaux & O'Hea, 2004; Sun et al., 2000). Furthermore, patient satisfaction in emergency care depends not only on clinical outcomes but also on communication, responsiveness, timely information, and the perceived organization of care. Recent evidence indicates that patient satisfaction is influenced by perceived waiting time, communication, responsiveness, and the quality of interactions with healthcare providers (Sonis et al., 2018; Asiri et al., 2025, Mosleh et al., 2025; Almulhim et al., 2025).

Effective communication is widely recognized as a key component of patient-centered emergency care and an important strategy for mitigating the negative effects of prolonged waiting times. Providing patients with timely information regarding expected waiting time, reasons for delays, and updates on their care process has been associated with improved patient experience and satisfaction, while helping to address uncertainty during the waiting period (Boudreaux & O'Hea, 2004; Sonis et al., 2018; Asiri et al., 2025, Frau et al., 2024; Bissonette et al., 2024). Nevertheless, communication alone cannot fully offset the adverse effects of ED overcrowding. Sustainable improvements in patient satisfaction and perceived quality of care require both effective communication and operational strategies that enhance patient flow, optimize resource allocation, and reduce unnecessary delays (Morley et al., 2018; Hoot & Aronsky, 2008).

Beyond their impact on patient satisfaction, ED overcrowding and prolonged waiting times may also influence patients' perceptions of safety and confidence in the care they receive. High patient volumes and increased workload may contribute to communication challenges, delays in patient assessment and treatment, and concerns regarding the timeliness and quality of care (Hoot & Aronsky, 2008; Morley et al., 2018). However, patients' perceptions of safety should be distinguished from objectively documented medical errors or adverse clinical events, as perceived quality and safety do not necessarily reflect actual clinical outcomes (Institute of Medicine, 2001; Vincent & Amalberti, 2016). Nevertheless, patients' perceptions of safety remain an important dimension of patient-centered care and provide valuable insights into healthcare quality and the overall emergency department experience (Boudreaux & O'Hea, 2004; Doyle et al., 2013).

The Lebanese healthcare system has faced substantial organizational, economic, and workforce challenges in recent years, placing considerable strain on hospitals and emergency departments. The country's prolonged economic crisis, shortages of healthcare resources, emigration of healthcare professionals, and increasing demand for emergency services have created additional barriers to the timely delivery of high-quality patient care (World Health Organization, 2022). In this context, understanding patients' experiences during periods of emergency department congestion is particularly important for identifying practical strategies to improve patient flow, preserve healthcare quality, and promote patient-centered emergency services.

Although numerous international studies have examined the effects of emergency department overcrowding on waiting times, patient satisfaction, and quality of care (Boudreaux & O'Hea, 2004; Hoot & Aronsky, 2008; Morley et al., 2018), limited evidence from Lebanon has examined how patients perceived waiting time and communication about expected waiting times are associated with their perceptions of care quality, satisfaction, safety, and complaint-related concerns.

Therefore, this study aimed to examine the associations between perceived emergency department waiting time, communication regarding expected waiting times, and patients’ perceptions of quality of care, satisfaction, and waiting-related concerns in a Lebanese hospital. Additionally, the study explored patients’ recommendations for improving emergency department flow.

METHODS

An analytical cross-sectional study was conducted to evaluate the relationship between emergency department waiting-time experiences, perceived quality of care, patient satisfaction, and safety-related perceptions. The study was performed in the Emergency Department of Haykel Hospital, Lebanon, between July and September 2024. The target population consisted of patients presenting to the Emergency Department during the study period. Eligible participants were conscious, clinically stable, non-critical patients who were able to understand and complete the questionnaire and who agreed to participate. Patients requiring immediate emergency intervention, those who were critically unstable, and those unable to provide responses were excluded. The study focused on patient experiences during

periods of high demand, when emergency department resources and patient-flow processes were subject to increased operational pressure.

A systematic random sampling technique was used to select participants over the three-month study period. A daily sampling frame was established based on the order of patient arrival, and one patient out of every 10 was selected without replacement. The first participant was determined each day using a computer-generated random number between 1 and 10. Sampling then continued at a fixed interval of 10 throughout the day.

A pilot phase was conducted during the first week of data collection to assess the study procedures and inform the required sample size. Based on the pilot findings, a minimum sample size of 250 participants was established using the conventional criterion of at least 10 outcome events per estimated parameter for logistic regression analysis (Peduzzi et al., 1996). The planned models included six parameters: one for the principal predictor, one for sex, and four for the five-category age variable. Assuming that approximately 24% of participants would fall into the smaller outcome category, at least 60 outcome events would require a total sample of approximately 250 participants. The final sample of 288 participants therefore exceeded the planned minimum (Vittinghoff & McCulloch, 2007; Ogundimu et al., 2016).

Data were collected using a structured patient questionnaire designed to assess different dimensions of the emergency department experience. The initial questionnaire was reviewed by a group of experts with relevant clinical/research expertise to assess the clarity and relevance of the items. It was subsequently pilot-tested during the initial phase of data collection, and minor modifications were made based on participant feedback before implementation in the main study. The questionnaire was developed based on relevant literature addressing emergency department workload, waiting-time experience, patient satisfaction, and perceived quality of care. The questionnaire was administered directly to eligible patients during their ED visit. Participation was voluntary, and responses were collected anonymously.

The main explanatory variables were perceived waiting time (Q3) and whether patients were informed about the expected waiting time at arrival (Q4). Patient-reported outcomes included the perceived effect of waiting on satisfaction (Q5), perceived effect on care (Q6), perceived probability of a complaint related to waiting time (Q7), and awareness of the right to refuse care when the waiting time was considered unacceptable (Q8). Sex and age were included as covariates in the multivariable analyses. Suggested improvement strategies and other concerns regarding the emergency department experience were analyzed descriptively.

Statistical Analysis

Data were entered and analyzed using IBM SPSS Statistics version 27.0.1. Categorical variables were summarized using frequencies and percentages.

Because the principal questionnaire measures were ordinal five-point scales, Spearman's rank correlation coefficient (ρ) was used to assess unadjusted associations between the original variables. Q8, which was measured as a binary variable, was analyzed using its original binary coding in the correlation analysis.

For multivariable analysis, ordinal logistic regression was initially considered for the five-point outcomes Q3, Q5, Q6, and Q7. However, the proportional-odds assumption was not satisfied. Therefore, these outcomes were dichotomized into scores 1–2 versus 3–5, representing lower versus moderate-to-high perceived consequences, respectively, and binary logistic regression was used for the adjusted analyses. Q8 was retained as a binary outcome (0 = No, 1 = Yes).

Separate binary logistic regression models were fitted for Q3, Q5, Q6, Q7, and Q8 as dependent variables. Information about the expected waiting time at arrival (Q4) was entered as the main independent variable, with sex and age included as covariates.

Additional binary logistic regression models were fitted for the dichotomized Q5, Q6, and Q7 outcomes. Perceived waiting time (Q3) was entered as a continuous predictor, with sex and age included as covariates. Adjusted odds ratios (aORs) with 95% confidence intervals (CIs) were reported. A two-sided p-value < 0.05 was considered statistically significant.

Ethical Considerations

The study was approved by the Institutional Review Board: Scientific and Ethical committee at Haykel Hospital before data collection (Reference No. 624-1; approval date: 21 June 2024). The study was conducted in accordance with the principles of the Declaration of Helsinki. Patients were informed about the purpose of the study, and participation was voluntary. No personally identifiable information was collected. All responses were anonymous, treated confidentially, and used exclusively for research purposes.

RESULTS

A total of 288 patients attending the Emergency Department were included. The sample consisted of 150 males (52.1%) and 138 females (47.9%). Participants were distributed across all age groups, with the largest proportion aged 20–30 years (25.0%) (Table 1).

Table 1
Demographic characteristics of participants (N = 288)

Characteristic	Category	n (%)
Sex	Male	150 (52.1)
	Female	138 (47.9)
Age group	< 20 years	50 (17.4)
	20–30 years	72 (25.0)
	31–40 years	67 (23.3)
	41–50 years	61 (21.2)
	> 50 years	38 (13.2)

Table 2 shows how patients experienced the waiting period. Most patients described the waiting time as short or moderate, although almost three in ten (29.2%) considered it long or very long. Only about half (50.7%) reported that they had been informed about the expected waiting time. Waiting time was perceived to have a noticeable effect on patients' experience: 60.4% reported at least a moderate effect on their satisfaction, and the same proportion reported at least a moderate effect on their care. More than half (54.1%) considered a complaint related to waiting time to be at least moderately probable. Awareness of the right to refuse care because of unacceptable waiting time was relatively low, with only 35.4% reporting that they were aware of this right.

Table 2
Waiting-Time Experience and Patient-Reported Consequences (N = 288)

Question / Variable	Response category	n (%)
Q3. Perceived waiting time	Very short	30 (10.4)
	Short	94 (32.6)
	Moderate	80 (27.8)
	Long	42 (14.6)
	Very long	42 (14.6)
Q4. Informed about expected waiting time	Yes	146 (50.7)
	No	142 (49.3)
Q5. Effect of waiting time on overall satisfaction	Not at all	28 (9.7)
	Slightly	86 (29.9)
	Moderately	110 (38.2)
	Considerably	36 (12.5)
	A great deal	28 (9.7)
Q6. Perceived effect of waiting time on care	Not at all	36 (12.5)
	Slightly	78 (27.1)
	Moderately	118 (41.0)
	Considerably	34 (11.8)
	Strongly	22 (7.6)
Q7. Perceived probability of a complaint related to waiting time	Not at all probable	34 (11.8)
	Slightly probable	98 (34.0)
	Moderately probable	96 (33.3)
	Considerably probable	20 (6.9)
	Very probable	40 (13.9)

Values are presented as n (%)

Question / Variable	Response category	n (%)
Q8. Awareness of the right to refuse care because of unacceptable waiting time	Yes	102 (35.4)
	No	186 (64.6)
Values are presented as n (%)		

Table 3 shows differences in waiting-time perceptions and patient-reported outcomes between patients who were informed about the expected waiting time and those who were not. Patients who received this information were more likely to report shorter waiting times and less likely to describe the waiting time as very long. Significant differences were also observed in the reported effects of waiting time on satisfaction, perceived care, and complaint-related concerns. Reported awareness of the right to refuse care because of unacceptable waiting time was considerably higher among informed patients (52.1%) than among those who were not informed (18.3%).

Table 3
Distribution of waiting-time perceptions and consequences according to whether patients were informed of the expected waiting time (N = 288)

Questions	Not informed	Informed	p-value
Q3. How would you rate the waiting time to be examined?			< 0.001
1 – Very short	6 (4.2)	24 (16.4)	
2 – Short	52 (36.6)	42 (28.8)	
3 – Moderate	24 (16.9)	56 (38.4)	
4 – Long	20 (14.1)	22 (15.1)	
5 – Very long	40 (28.2)	2 (1.4)	
Q5. To what extent do you think the waiting time influenced your overall satisfaction with the care received?			< 0.001
1 – Not at all	18 (12.7)	10 (6.8)	
2 – Slightly	46 (32.4)	40 (27.4)	
3 – Moderately	36 (25.4)	74 (50.7)	
4 – Considerably	18 (12.7)	18 (12.3)	
5 – A great deal	24 (16.9)	4 (2.7)	
Q6. Do you think that your care was affected by the waiting time?			0.001
1 – Not at all	26 (18.3)	10 (6.8)	
2 – Slightly	40 (28.2)	38 (26.0)	
3 – Moderately	46 (32.4)	72 (49.3)	
4 – Considerably	14 (9.9)	20 (13.7)	
5 – Strongly	16 (11.3)	6 (4.1)	
Q7. Do you think that the waiting time could lead to a complaint against the service?			0.013
1 – Not at all probable	14 (9.9)	20 (13.7)	
2 – Slightly probable	50 (35.2)	48 (32.9)	
3 – Moderately probable	38 (26.8)	58 (39.7)	
4 – Considerably probable	12 (8.5)	8 (5.5)	
5 – Very probable	28 (19.7)	12 (8.2)	

Questions	Not informed	Informed	p-value
Q8. Awareness of the right to refuse care because of unacceptable waiting time			< 0.001
No	116 (81.7)	70 (47.9)	
Yes	26 (18.3)	76 (52.1)	

Values are n (%); percentages are column percentages. Q3, Q5, Q6, and Q7 were dichotomized as scores 1–2 versus 3–5 and analyzed using binary logistic regression adjusted for sex and age. Q8 was analyzed as a binary outcome using Pearson's chi-square test for the unadjusted comparison and binary logistic regression for the adjusted analysis.

For the analyses presented in Table 4, separate binary logistic regression models were fitted for Q3, Q5, Q6, Q7, and Q8. Q3, Q5, Q6, and Q7 were dichotomized as scores 1–2 versus 3–5, while Q8 was retained as a binary outcome. All models were adjusted for sex and age. Information about the expected waiting time at arrival (Q4) was entered as the principal independent variable. After adjustment, patients who had been informed about the expected waiting time had higher odds of being aware of their right to refuse care (adjusted OR = 4.804, 95% CI: 2.807–8.221, $p < 0.001$), while sex and age were not significant predictors.

Table 4
Association between information about expected waiting time and patient-reported waiting-time outcomes: unadjusted and adjusted analyses (N = 288)

Patient-reported outcome	Spearman ρ	p-value	Adjusted OR	95% CI	p-value
Q3. Moderate-to-very-long perceived waiting time	−0.238	< 0.001	0.847	0.528–1.359	0.492
Q5. Moderate-to-high perceived effect of waiting on satisfaction	−0.008	0.899	1.546	0.952–2.510	0.078
Q6. Moderate-to-high perceived effect of waiting on care	0.097	0.101	1.771	1.093–2.869	0.020
Q7. Moderate-to-high probability of complaint	−0.099	0.092	0.943	0.590–1.505	0.805
Q8. Awareness of the right to refuse care if the waiting time is unacceptable	0.353	< 0.001	4.804	2.807–8.221	< 0.001

Note: OR, odds ratio; CI, confidence interval; ρ, Spearman correlation coefficient. P-values represent unadjusted associations using Spearman's rank correlation. For adjusted analyses, Q3, Q5, Q6, and Q7 were dichotomized as scores 1–2 versus 3–5 and analyzed using binary logistic regression adjusted for sex and age. Q8 was analyzed as a binary outcome using Pearson's chi-square test for the unadjusted comparison and binary logistic regression for the adjusted analysis. All models were adjusted for sex and age, with Q4 (information about expected waiting time at arrival) as the principal independent variable.

After adjustment for sex and age, information about the expected waiting time at arrival was significantly associated with awareness of the right to refuse care (aOR = 4.804, 95% CI: 2.807–8.221, p < 0.001). Patients who were informed about the expected waiting time were more likely (4.8 times higher odds) to report awareness of their right to refuse care because of unacceptable waiting time. No statistically significant adjusted association was observed between being informed about the expected waiting time and Q3, Q5, or Q7.

The associations between perceived waiting time and patient-reported outcomes, including unadjusted correlations and adjusted odds ratios, are presented in Table 5.

Table 5
Association between perceived waiting time and patient-reported outcomes: unadjusted and adjusted analyses (N = 288)

Patient-reported outcome	Spearman ρ	p-value	Adjusted OR	95% CI	p-value
Q5. Moderate-to-high perceived effect of waiting on satisfaction	0.334	< 0.001	1.521	1.224–1.891	< 0.001
Q6. Moderate-to-high perceived effect of waiting on care	0.202	< 0.001	1.324	1.077–1.628	0.008
Q7. Moderate-to-high probability of complaint	0.287	< 0.001	1.525	1.238–1.879	< 0.001

Note: Q5, Q6, and Q7 were dichotomized as scores 1–2 versus 3–5 for logistic regression; Spearman's ρ represents the unadjusted association using the original five-point scales, and each adjusted model included Q3, sex, and age, with Q3 entered as a linear continuous predictor.

Each one-category increase in perceived waiting time was associated with 52.1% higher odds of reporting a moderate-to-high negative impact of waiting on satisfaction (aOR = 1.521, 95% CI: 1.224–1.891, p < 0.001). Similarly, each one-category increase in perceived waiting time was associated with 32.4% higher odds of reporting a moderate-to-high perceived impact of waiting on care (aOR = 1.324, 95% CI: 1.077–1.628, p = 0.008). For Q7, each one-category increase in perceived waiting time was associated with 52.5% higher odds of reporting a moderate-to-high likelihood of complaining (aOR = 1.525, 95% CI: 1.238–1.879, p < 0.001). Overall, perceived waiting time was significantly associated with all three assessed outcomes, with the strongest association observed for satisfaction and complaint-related concerns. Sex was independently associated only with satisfaction, whereas age was not independently associated with any of the three outcomes.

Table 6 summarizes patients' suggestions for reducing waiting times and their other concerns regarding the Emergency Department experience. The most commonly suggested measures were improving triage at entry (36.8%) and increasing the number of healthcare staff (36.1%). Clearer information about waiting times was suggested by 18.8% of patients, while fewer patients identified the use of technology for patient-flow management (6.9%) or more comfortable waiting areas (1.4%) as priorities.

Table 6
Suggested Improvements and Other Concerns Regarding Emergency Department Care (N = 288)

Variable / response category	**n (%)**
Q9. Suggested improvements to reduce waiting times in the emergency department	
Improve triage at entry	106 (36.8)
Increase the number of healthcare staff	104 (36.1)
Provide clear information about waiting times	54 (18.8)
Use technologies to manage patient flow	20 (6.9)
Establish comfortable waiting areas	4 (1.4)
Q10. Other concerns regarding the emergency department experience	
No additional concerns	52 (18.1)
Discomfort in the waiting room	110 (38.2)
Lack of communication with staff	76 (26.4)
Dissatisfaction with information received	48 (16.7)
Delay in seeing the physician	2 (0.7)

Regarding other concerns, discomfort in the waiting room was the most frequently reported issue (38.2%), followed by lack of communication with staff (26.4%) and dissatisfaction with the information received (16.7%). Only 18.1% reported having no additional concerns. These findings indicate that patients' concerns extend beyond waiting time itself and include issues related to the organization of care, staffing, communication, and the waiting environment.

DISCUSSION

Emergency department (ED) waiting time remains a critical factor influencing patient experience and perceived healthcare quality. The present study evaluated patients’ perceptions of waiting time, communication regarding expected delays, and their adjusted associations with satisfaction, perceived quality of care, and complaint-related concerns. A key finding of this study is that while communication about expected waiting times (Q4) showed strong associations in unadjusted analyses, its significance was nuanced after controlling for patient age and sex. Specifically, providing waiting-time information was not independently associated with a reduction in moderate-to-very-long perceived waiting times (Q3, $p = 0.492$) or overall satisfaction levels (Q5, $p = 0.078$). Instead, the primary independent effects of communication were observed in significantly increasing patients' awareness of their right to refuse care (Q8, $p < 0.001$) and influencing their perception of how waiting impacted their care delivery (Q6, $p = 0.020$). Conversely, the patient's subjective *perceived* waiting time (Q3) emerged as the most consistent

predictor of negative outcomes, demonstrating robust, independent associations with reduced satisfaction, poorer care perceptions, and heightened complaint-related concerns.

The lack of a significant adjusted association between waiting-time communication and perceived waiting duration (Q3) or satisfaction (Q5) challenges some traditional assumptions in emergency care literature [Boudreaux & O'Hea, 2004]. While descriptive trends indicated that informed patients reported fewer "very long" waits, the multivariable model suggests that communication alone does not alter the fundamental cognitive or psychological burden of a delay once demographic factors are accounted for. This indicates that simply informing a patient of a delay cannot fully mitigate the strain of prolonged operational bottlenecks, a reality heavily highlighted by modern structural evaluations [Asiri et al., 2025; Janerka et al., 2024]. Interestingly, patients who were informed about their expected waiting time had 1.77 times higher odds of reporting a moderate-to-high perceived effect of waiting on their care (aOR = 1.771, 95% CI: 1.093–2.869, p = 0.020). This clinical paradox suggests that while transparency is essential for patient autonomy [Frau et al., 2024; Bissonette et al., 2024], explicit communication regarding delays may inadvertently make patients hyper-aware of operational constraints, causing them to reflect more critically on how the passage of time might be affecting the quality or safety of their medical evaluation.

Beyond the direct role of information delivery, the perceived quality of clinical care in the ED remains intrinsically multidimensional. In the unadjusted analysis, communication regarding expected waiting time was not significantly associated with the perceived effect of waiting on care (Spearman ρ = 0.097, p = 0.101). However, after adjustment for sex and age, patients who had been informed about the expected waiting time had higher odds of reporting a moderate-to-high perceived effect of waiting on care (aOR = 1.771, 95% CI: 1.093–2.869, p = 0.020). This finding indicates that while communication provides structural clarity and enhances patient autonomy, it cannot act as a surrogate for actual clinical efficiency or substitute for essential care delivery processes. Perceived quality is inherently shaped by distinct, unmeasured clinical parameters—such as the perceived thoroughness of medical examinations, clinician bedside manner, and the physical comfort of the care environment—which operate independently of whether a patient was given a waiting timeline upon arrival (Sun et al., 2000; Trout et al., 2000). Consequently, operational interventions that streamline throughput must occur in parallel with informational updates to effectively shift baseline quality metrics (Youssef et al., 2024).

A robust independent predictor of patient-reported outcomes emerged in the subjective duration of the wait itself. Each one-category increase in perceived waiting time (Q3) was associated with a significant escalation in negative evaluations across all three primary dimensions: overall satisfaction (aOR = 1.521), perceived care impact (aOR = 1.324), and the anticipated probability of filing an institutional complaint (aOR = 1.525). The consistency of these adjusted associations emphasizes that the psychological weight of prolonged waiting is a primary driver of service dissatisfaction and institutional friction, mirroring global trends where operational throughput bottlenecks directly degrade the patient experience (Ahmed et al., 2026; Oskvarek et al., 2026). When patients perceive a delay as excessive, it predictably compounds their vulnerability, translating into a heightened likelihood of downstream

administrative complaints (Fujioka et al., 2025; Mosleh et al., 2025). This reality underscores the critical need for hospitals to deploy targeted patient-flow metrics alongside structural staff adjustments to lower waiting times (Samadbeik et al., 2024).

Furthermore, perceived waiting time was associated with increased complaint-related concerns. Patients reporting longer perceived waiting times were more likely to perceive that delays could contribute to dissatisfaction and potential complaints. This observation is consistent with previous studies showing that waiting experiences represent one of the most frequent sources of patient dissatisfaction in emergency services (Boudreaux & O'Hea, 2004, Fujioka et al., 2025; Mosleh et al., 2025). However, it is important to note that the present study assessed perceived likelihood of complaints rather than documented complaints or adverse clinical outcomes. Therefore, these findings should be interpreted as reflecting patient concerns and expectations rather than objective safety events.

The association with satisfaction was stronger than those observed for the other assessed outcomes. This finding further supports the importance of waiting-time experience in patients' overall evaluation of ED care. Patient satisfaction depends not only on clinical outcomes but also on interpersonal communication, perceived attention, and respect during the care process (Boudreaux & O'Hea 2004). Consequently, interventions designed to improve satisfaction should address both service efficiency and the psychological experience of waiting.

Patients' recommendations for improving ED services further support the need for combined operational and communication-based strategies. Patients most frequently recommended improving triage procedures and increasing healthcare staffing. Providing clearer information about expected waiting times was the next most common recommendation, followed by the use of technology to improve patient-flow management, whereas establishing more comfortable waiting areas was suggested less frequently. Effective triage systems are essential for prioritizing patients according to clinical urgency and improving patient flow, while adequate staffing contributes to timely assessment and care delivery. Nevertheless, evidence suggests that increasing resources alone may be insufficient if underlying workflow inefficiencies and communication gaps are not addressed (Morley et al., 2018). Integrated approaches combining process redesign, improved information systems, and patient-centered communication may provide more sustainable improvements.

This study has several strengths. It provides patient-centered evidence regarding ED waiting experiences and evaluates multiple dimensions of care perception, including satisfaction, perceived quality, and complaint-related concerns. Additionally, the use of ordinal-based statistical approaches allowed appropriate analysis of patient-reported responses.

Patients' targeted recommendations for reducing emergency congestion further emphasize the practical necessity of combining operational process adjustments with systematic communication strategies. Over one-third of the participants prioritized frontline structural interventions, specifically recommending improvements to triage entry processes (36.8%) and increases in frontline healthcare staffing (36.1%).

These patients preferences mirror international health service consensus, where refined triage algorithms and optimized staffing levels serve as the bedrock for mitigating access block (Darraj et al., 2023; Pearce et al., 2024). However, infrastructural expansions alone are frequently insufficient if internal workflow fragmentation remains unaddressed (Morley et al., 2018). This is highlighted by the substantial proportion of patients reporting ambient discomfort in the waiting environment (38.2%) and explicit communication disconnects with healthcare personnel (26.4%). Sustainable optimization therefore requires an integrated layout that balances structural resource allocation with physical waiting-room enhancements and communicative touchpoints.

This study has several notable strengths, including a rigorous systematic random sampling approach and an analytical focus on multi-dimensional patient-reported outcomes within an under-researched regional healthcare landscape. However, certain limitations must be noted. First, data collection was restricted to a single private hospital center, which may constrain the immediate generalizability of the findings to public or varied tertiary settings across Lebanon. Second, the cross-sectional study design captures patient sentiment at a single time point, preventing the derivation of definitive causal relationships between waiting intervals and perception shifts. Third, waiting timelines were tracked using patient-reported subjective perception rather than synchronized timestamp logs. While subjective time serves as the primary driver of the psychological burden of care and subsequent satisfaction metrics (Boudreaux & O'Hea, 2004), future multi-center trials pairing objective throughput timestamps with perceived tracking would provide deeper operational clarity. Finally, the structured questionnaire was pilot-tested and expert-reviewed but lacks formal international psychometric validation.

CONCLUSION

In conclusion, this study demonstrates that subjective perceived waiting time is a robust, independent driver of patient dissatisfaction, altered care quality perceptions, and complaint-related vulnerabilities within the emergency department. While unadjusted trends suggest immediate benefits from information sharing, multivariable regression demonstrates that structural communication primarily enhances patient legal autonomy regarding care refusal and alters critical reflections on care delivery, rather than acting as a universal buffer against the strain of delayed care. To cultivate a truly patient-centered emergency care environment, healthcare organizations must deploy multi-faceted strategies that pair digital communication updates with targeted triage re-engineering, adequate staffing matrices, and structural waiting room management.

Declarations

No specific grant from any funding agency in the public, commercial, or not-for-profit sectors was received for this research.

The authors declare that they have no competing interests. The data is available upon request.

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Author Contribution

N.B. Objective, Methodology, ReviewA.R. K. Data collection, Analysis, WrittingG.C. Data collection, Analysis, WrittingI. Z. Data collection, Analysis, WrittingC.S. Methodology, ReviewS.F. Analysis, Writing, Review

Data Availability

The Ungdata surveys that support the findings of this study are available from Haykel Hospital. The data are, however, available upon request and with the permission of Haykel Hospital.

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