



Pediatric Discharge Against Medical Advice in a Tehran Hospital Serving Iranian and Afghan Children: A Mixed-Methods Study

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Abstract

Background: Pediatric discharge against medical advice (DAMA) may reflect clinical, financial, familial, and service-related pressures, particularly in migrant and uninsured populations.

Objectives: To compare DAMA occurrence and documented reasons for DAMA between discharge episodes involving Iranian and Afghan children and to develop expert-informed recommendations.

Methods: At a pediatric hospital in Tehran serving Iranian and Afghan children, we conducted a mixed-methods study in 2024 - 2025. The quantitative analysis included all 4,540 discharge episodes, with the discharge episode as the unit of analysis. Child-clustered modified Poisson generalized estimating equation models estimated DAMA occurrence (adjusted for month) and the prevalence of cost/insurance-related reasons among DAMA episodes (adjusted for sex, length of stay, admission reason, and ward). Five Hospital Information System reason categories were hierarchically mutually exclusive; co-recorded reasons were retained separately. A small purposive sample of six DAMA caregivers and seven DAMA care/management staff completed semi-structured interviews, which were analyzed using inductive qualitative content analysis. Eight experts with ≥ 2 years' DAMA-related experience prioritized domains, and a nine-member panel developed recommendations.

Results: Among 4,540 discharge episodes, 1,088 (24.0%) ended in DAMA. DAMA occurred in 61.9% of episodes involving Afghan children and 20.3% of those involving Iranian children (month-adjusted RR = 3.10, 95% CI 2.81 - 3.42). In the mutually exclusive primary classification, perceived recovery was the predominant reason for DAMA among episodes involving Iranian children (74.9%). Cost/insurance-related reasons were recorded in 127/250 (50.8%) DAMA episodes involving Afghan children versus 10/838 (1.2%) involving Iranian children. This marked disparity was estimated imprecisely (adjusted prevalence ratio = 41.63, 95% CI 22.15 - 78.25) because only 10 such episodes involved Iranian children. Eight experts ranked financial/insurance factors as most important.

Conclusions: Nationality-defined differences should not be interpreted causally; rather, they should be considered in the context of financial and structural vulnerability. Expert-informed recommendations emphasized communication about clinical readiness, financial assessment and support, and clearer documentation; prospective evaluation is required.

Keywords: Patient Discharge, Treatment Refusal, Pediatrics, Emigrants and Immigrants, Healthcare Accessibility, Medically Uninsured, Health Equity

1. Background

Discharge against medical advice (DAMA), defined as leaving the hospital before the recommended inpatient care is complete, is associated with increased readmission

and other adverse health outcomes (1, 2). In pediatric care, the issue is more complex because parents or guardians typically make decisions on the child's behalf in interactions with the clinical team (3, 4). Reported pediatric DAMA rates vary widely across settings, with

international studies reporting rates of approximately 1%–6%; in Iran, a systematic review and meta-analysis estimated a pooled rate of 3.7% in pediatric departments (2, 5).

Pediatric DAMA has been linked to perceived recovery, financial or insurance difficulties, dissatisfaction with care, communication problems, and family responsibilities (2, 6–11). These varied circumstances suggest that DAMA cannot be understood simply as parental refusal of continued treatment. More broadly, recent Iranian evidence has identified both patient- and physician-level correlates of DAMA, supporting its multilevel nature (12).

Among migrant families, financial, insurance, language, documentation, and administrative barriers can restrict continuity of care (13, 14). In Iran, Afghan migrants may face additional constraints related to insurance eligibility, financial support, and documentation status (15–18). Iran's Universal Public Health Insurance (UPHI) provides an insurance pathway for eligible registered refugees, whereas access to this pathway is more limited for migrants without qualifying documentation; importantly, eligibility does not necessarily indicate actual enrollment (15, 17). From a structural vulnerability perspective, such conditions may narrow the options realistically available to families and shape decisions made within broader legal, economic, and institutional constraints (19).

Several hospital-based studies have focused on the frequency, characteristics, and recorded reasons for pediatric DAMA (6–9), whereas quantitative comparisons across culturally or linguistically defined pediatric groups within the same institutional setting remain limited (20). It also remains unclear how fully administrative reason coding captures concurrent pressures when more than one reason is present. A recent mixed-methods study integrated caregiver and health-professional perspectives on pediatric DAMA (21), but it remains unclear how such perspectives can be integrated with administrative findings to inform organizational prioritization. The study was prompted by a service-level concern that DAMA might be disproportionately concentrated among episodes involving Afghan children, in a setting where the contextual barriers outlined above could differ between groups. Hospital Information System (HIS)-recorded nationality was therefore used as an administrative stratification variable to examine this service-level pattern, not as a presumed causal mechanism.

2. Objectives

Accordingly, this sequential, multiphase mixed-methods study compared DAMA occurrence and recorded reasons across discharge episodes involving Iranian and Afghan children; examined cost/insurance-related and co-

recorded reasons; integrated caregiver and staff accounts with the quantitative findings; and prioritized context-specific management responses.

3. Methods

3.1. Study Design and Setting

A sequential multiphase mixed-methods study was conducted from 20 March 2024 to 20 March 2025 at Shahid Fahmideh Specialized Children's Hospital, a public, university-affiliated pediatric hospital with 64 active beds in southwestern Tehran, providing pediatric, neonatal, and emergency care without intensive care units. The hospital serves Tehran and the southern and southwestern areas of the province and operates outside the formal referral system. During the study year, 4,540 eligible discharge episodes were recorded (approximately 378/month): 4,136 (91.1%) involving Iranian children and 404 (8.9%) involving Afghan children. The hospital social work unit assessed financial needs and coordinated support directly with charitable organizations. Quantitative analyses examined DAMA occurrence and recorded reasons; qualitative interviews contextualized these findings, followed by mixed-methods integration, expert prioritization, and management recommendations.

3.2. Quantitative Data Sources, DAMA Identification, and Variables

Episode-level HIS records for all 4,540 eligible discharge episodes were retrospectively extracted and used to analyze DAMA occurrence. DAMA episodes were identified using the HIS discharge-status field. Episode-level records for the 1,088 DAMA episodes were additionally used to examine demographic and clinical characteristics and recorded reasons for DAMA. Under the hospital's routine DAMA documentation process, a DAMA discharge required a caregiver-requested discharge, a signed DAMA form, physician documentation that continued care was recommended, and corresponding nursing and HIS records. No HIS-identified DAMA episode was excluded because of missing or inconsistent documentation. The DAMA form contained separate sections for the caregiver's stated reason(s) for requesting discharge, documentation by the nurse directly responsible for the child's care, and documentation by the treating physician. Only the caregiver-stated DAMA reason(s) were entered into the corresponding HIS reason field by responsible ward personnel and constituted the reason data analyzed in this study. Extracted variables were sex, nationality, reason for admission, inpatient ward, length of stay, and recorded DAMA reason.

Nationality was obtained from the administrative nationality field in the hospital HIS. For Iranian patients, nationality was recorded based on national identification documents (national ID card or birth certificate), whereas for Afghan patients, it was based on caregiver-reported nationality. The extracted dataset contained only Iranian and Afghan values, with no missing, unknown, dual, or indeterminate entries. Nationality was used solely as an administrative comparison variable and was not treated as a measure or proxy of ethnicity, migration status, documentation status, insurance status, or financial vulnerability.

The discharge episode was the primary unit of analysis, and individual children could contribute more than one eligible discharge episode during the study period. Unique children and repeated episodes were identified using the hospital patient identifier. A repeated discharge was defined as more than one eligible discharge episode for the same child during the study period, and repeated DAMA was defined analogously as more than one DAMA episode. The hospital patient identifier was also used to identify each child's first eligible discharge episode and first DAMA episode for sensitivity analyses.

Migration and documentation status were not recorded in the HIS dataset, and insurance status was not used as a proxy for either.

3.3. Recoding of DAMA Reasons

The 56 HIS reason codes, including single- and multiple-reason entries, were recoded into five mutually exclusive categories: perceived recovery, cost/insurance-related, treatment-related, hospital-related, and other factors. Because some episodes contained multiple reasons, a deterministic hierarchy was used to assign a single analytic category. Entries mentioning cost or lack of insurance were prioritized because this preserved an explicitly documented financial constraint that would otherwise be lost when co-recorded with perceived recovery; this rule did not imply that cost/insurance was the sole or causally dominant reason for DAMA. Original codes were retained to identify co-recorded reasons, and entries containing two or more distinct reasons were defined as multiple-reason codes. Two researchers jointly reviewed each mapping and resolved uncertainties by consensus, consulting a third senior researcher when necessary. Because no independent pre-consensus classifications were generated, pre-consensus inter-rater agreement could not be estimated. The complete mapping and frequency of each original HIS-recorded reason pattern are presented in Table S1 in the Supplementary File.

As a sensitivity analysis, an alternative recovery-priority hierarchy was applied. Episodes with co-recorded

cost/insurance-related factors and perceived recovery were reassigned to perceived recovery; all other assignments were unchanged. The cost/insurance prevalence-ratio analysis was then repeated using the same model specification as in the primary analysis.

3.4. Qualitative Participants and Interviews

Six caregivers directly involved in a DAMA decision and seven staff members involved in DAMA-related care or management were purposively recruited. The caregiver sample was purposively structured to include three interviews involving Iranian children and three involving Afghan children; clinical and DAMA-related characteristics of these six cases are presented in Table S2 in the Supplementary File. When a DAMA process was initiated, ward staff notified the educational supervisor, who informed the interviewer; the interviewer then approached the caregiver in person, explained the study, and invited participation. All six caregivers approached agreed to participate. Eligibility required direct participation in Persian because the interviews were designed for Persian-language administration, a trained research interpreter was not available, and the brief interval between DAMA initiation and hospital departure did not allow sufficient time to arrange a professional interpreter; staff or family members were not used as informal interpreters. None of the six caregivers approached was excluded for language reasons.

Caregiver interviews were conducted after DAMA initiation and before hospital departure by S.K., a female doctoral researcher in health services management trained in qualitative interviewing and analysis, who was not employed by the hospital, had no role in the child's care, and had no prior relationship with participants. S.K. also conducted the staff interviews. Caregiver interviews were conducted without members of the child's clinical team present.

Separate semi-structured guides were used for caregivers and staff (Supplementary File). Interviews were conducted in Persian, audio-recorded, and transcribed verbatim; ambiguous segments were checked against the audio recordings during transcription, and caregiver interviews lasted approximately 30 minutes. Caregiver quotations were coded IR-C or AF-C according to the child's nationality, and staff quotations were coded P1-P7. The qualitative component was used to contextualize and elaborate the administrative findings rather than to estimate prevalence or support generalization; saturation was not claimed, and caregiver accounts were not used for formal nationality comparisons.

3.5. Qualitative Analysis and Integration

Caregiver and staff interviews were analyzed separately using inductive qualitative content analysis, following Graneheim and colleagues (22, 23). Meaning units were condensed, coded, and iteratively grouped into subcategories and categories. No a priori HIS-based framework was used; qualitative categories were developed independently and mapped to the five HIS domains only after qualitative analysis.

Caregiver transcripts were initially coded by S.K., a doctoral researcher in health services management, and staff transcripts by H.A.G., a professor of health services management with extensive experience in qualitative research; neither held a clinical or managerial role in the study hospital. Each dataset was subsequently cross-checked by the second researcher at the code and subcategory levels rather than independently double-coded in full. Differences and category boundaries were discussed and refined by consensus, with agreed changes recorded in the final coding matrices. Coding was managed in Microsoft Excel. A separate formal audit trail was not maintained; however, the final coding matrices documented the progression from meaning units and condensed meaning units to codes, subcategories, and categories, together with agreed coding revisions. Formal field notes and member checking were not used. Detailed coding trees with illustrative quotations are provided in Tables S3 and S4 in the Supplementary File. After separate quantitative and qualitative analyses, findings were integrated using a joint-display approach (24). The joint-display structure and integration labels were developed during the review of both datasets rather than prespecified. Independently derived qualitative categories were compared with the HIS domains by conceptual correspondence, while findings extending beyond those domains were retained. Convergence denoted substantive consistency across sources; expansion, additional contextual information; differing emphasis, variation in prominence or framing of the same issue; and source-specific findings, findings confined to one source. Negative or discordant findings were retained and examined during integration. The integration of the quantitative and qualitative findings was reviewed by S.K., M.J., H.A.G., and J.A. Disagreements regarding the mapping of findings across data sources or the application of the integration labels were discussed among the integration team and resolved by consensus.

3.6. Expert Prioritization and Management Recommendations

Experts participating in the prioritization survey and structured panel were purposively recruited from the study hospital and other relevant units of Iran University of Medical Sciences. Eligibility required at least two years

of professional experience in a clinical, managerial, supervisory, or quality-improvement role involving DAMA-related care or discharge processes. Following integration, eight experts completed an anonymous one-round survey rating the importance of the five DAMA domains and their within-domain subfactors on five-point scales. The five rating domains corresponded to the five domains used in the mixed-methods integration, and the within-domain items were derived from the integrated quantitative and qualitative findings. Domain-level and within-domain rankings were derived from these ratings.

A nine-member structured expert panel, including two survey participants, reviewed the integrated findings and prioritization results, generated and refined candidate management strategies, and rated the retained strategies separately for expected impact and feasibility on five-point scales. Mean ratings were classified using prespecified descriptive categories. The panel was chaired by a faculty member with prior experience in conducting structured expert panels, with a member of the research team serving as facilitator. Panel discussion and strategy ratings were non-anonymous. No formal conflict-of-interest screening was conducted; role-related interests were treated as stakeholder perspectives rather than grounds for exclusion. Candidate strategies were discussed iteratively, disagreements were resolved through discussion, and eight strategies were retained by consensus without a numerical recommendation-acceptance threshold. During the panel, participants collectively specified the responsible units, implementation timeframes, and monitoring indicators for the retained strategies.

The full prioritization questionnaire and panel-rating instrument are provided in the Supplementary File; expert characteristics and affiliations are presented in Table S5 in the Supplementary File.

3.7. Data Analysis

Analyses were performed in SPSS version 23. Categorical variables were summarized as frequencies and percentages, and length of stay as the median and interquartile range. Among DAMA episodes, nationality differences in sex, reason for admission, inpatient ward, and the five recorded-reason categories were assessed using chi-square tests, with Cramer's V as the effect-size measure. Length of stay was compared by nationality using the Mann-Whitney U test (effect size r) and across reason categories using the Kruskal-Wallis test (ϵ^2). Risk ratios (RRs) for DAMA occurrence and prevalence ratios (PRs) for binary outcomes among DAMA episodes were reported with 95% confidence intervals.

For DAMA occurrence, an episode-level modified Poisson generalized estimating equations (GEE) model

with a log link and robust covariance clustered by patient identifier was used to account for repeated discharge episodes within children. DAMA status was the outcome, nationality the primary comparison variable, and discharge month a categorical covariate. Further individual-level adjustment was not undertaken because comparable child-level clinical, socioeconomic, and documentation-related covariates were unavailable for non-DAMA episodes.

Among DAMA episodes, a second modified Poisson GEE model with a log link, an independent working correlation structure, and child-clustered robust covariance estimated the adjusted PR for a cost/insurance-related recorded reason, adjusting for sex, length of stay, reason for admission, and inpatient ward. Length of stay was entered as a continuous linear term in days; sex was binary (reference: girl), reason for admission was a five-level categorical variable (reference: respiratory), and inpatient ward was a four-level categorical variable (reference: Pediatric 1). Iranian nationality was the reference group. All 1,088 DAMA episodes were included, with no missing outcome or covariate data. Outcome counts across categorical covariates were examined for sparse cells, and model convergence was assessed from the GEE iteration history and numerical warnings; detailed cell counts and model results are provided in Table S6 in the Supplementary File. Granular HIS codes were summarized descriptively to identify co-recorded reasons.

Expert ratings were analyzed using Friedman tests, with Kendall's W assessing concordance; no statistical consensus threshold was applied. Within-expert ranks ranged from 1 (lowest) to 5 (highest importance) for the five domains and from 1 to 4 for the four subfactors within each domain. Reported values are Friedman mean ranks, not mean Likert scores.

Sensitivity analyses restricted the DAMA-occurrence model to each child's first eligible discharge episode and DAMA-specific analyses to each child's first DAMA episode, yielding one observation per child (Table S7 in the Supplementary File). Sensitivity to sparse categorical cells and model specification was additionally assessed using a parsimonious cost/insurance modified Poisson GEE model retaining nationality, sex, and length of stay while omitting the multilevel reason-for-admission and inpatient-ward covariates.

3.8. Ethical Considerations

The Ethics Committee of Iran University of Medical Sciences approved the study (IR.IUMS.REC.1403.298). Interview participants provided written informed consent, including for audio-recording. Administrative data were

de-identified, access was restricted to the research team, and findings were reported in aggregate.

4. Results

4.1. Quantitative Findings

4.1.1. DAMA Occurrence by HIS-Recorded Nationality

The 4,540 eligible discharge episodes represented 4,240 unique children and comprised 4,136 episodes involving Iranian children and 404 involving Afghan children. Of these, 264 children (6.2%) contributed more than one eligible discharge episode during the study period. Overall, 1,088 discharge episodes ended in DAMA (24.0%), representing 1,066 unique children; 838/4,136 (20.3%) occurred among episodes involving Iranian children and 250/404 (61.9%) among those involving Afghan children. Twenty children contributed more than one DAMA episode; 18 had two DAMA episodes, and two had three. The crude RR for DAMA in episodes involving Afghan versus Iranian children was 3.05 (95% CI 2.77 - 3.37) (Table 1; Table S8 in the Supplementary File).

In the sensitivity analysis restricted to the first eligible discharge episode per child ($n = 4,240$), the month-adjusted estimate was similar (RR = 3.03, 95% CI 2.74 - 3.35; $P < 0.001$) (Table S7 in the Supplementary File).

4.1.2. Characteristics of DAMA Episodes

Among DAMA episodes, sex, reason for admission, and inpatient ward did not differ significantly by HIS-recorded nationality (all $P > 0.05$). Median length of stay was shorter for DAMA episodes involving Afghan children than for those involving Iranian children (2 days [IQR 2] vs 3 days [IQR 3]; $P < 0.001$; $r = 0.14$) (Table 2). Length of stay also differed across the five HIS-recorded reason categories (Kruskal-Wallis $H(4) = 40.401$, $P < 0.001$; $\epsilon^2 = 0.034$), ranging from a median of 1 day (IQR 3) for hospital-related factors to 3 days for perceived recovery (IQR 3) and treatment-related factors (IQR 5). Results were similar in sensitivity analyses restricted to the first DAMA episode per child ($n = 1,066$), with no change in the statistical conclusions for sex, reason for admission, inpatient ward, or length of stay (Table S7 in the Supplementary File).

4.1.3. HIS-Recorded Reasons Among DAMA Episodes

Under the primary mutually exclusive classification, perceived recovery was the most frequently recorded reason overall (733/1,088, 67.4%), but the distribution differed markedly by HIS-recorded nationality ($\chi^2(4) = 434.844$, $P < 0.001$; Cramer's $V = 0.632$). It predominated

Table 1. Pediatric Discharge Against Medical Advice by HIS-Recorded Nationality, 2024 - 2025 ^a

Nationality	Total discharge episodes	DAMA episodes	Non-DAMA episodes	Crude RR (95% CI)	Adjusted RR ^b (95% CI)
Iranian	4,136	838 (20.3)	3,298 (79.7)	1.00	1.00
Afghan	404	250 (61.9)	154 (38.1)	3.05 (2.77 - 3.37)	3.10 (2.81 - 3.42)

^a Values are expressed as number or No. (%). HIS, Hospital Information System.

^b Adjusted RRs were estimated using episode-level modified Poisson generalized estimating equations with a log link and robust covariance clustered by patient identifier to account for repeated discharge episodes within children; discharge month was entered as a categorical covariate. RR, risk ratio; CI, confidence interval; DAMA, discharge against medical advice.

Table 2. Demographic and Clinical Characteristics of DAMA Episodes by HIS-Recorded Nationality ^a

Variables	Total Episodes	Episodes Involving Iranian Children	Episodes Involving Afghan Children	Statistical Test
Sex				$\chi^2(1) = 0.509$, $P = 0.475$; Cramer's $V = 0.022$
Girl	395 (36.3)	309 (36.9)	86 (34.4)	
Boy	693 (63.7)	529 (63.1)	164 (65.6)	
Reason for admission				$\chi^2(4) = 5.075$, $P = 0.280$; Cramer's $V = 0.068$
Respiratory	300 (27.6)	221 (26.4)	79 (31.6)	
Viral infection	178 (16.4)	133 (15.9)	45 (18.0)	
Gastrointestinal	330 (30.3)	263 (31.4)	67 (26.8)	
Seizure/neurology	64 (5.9)	48 (5.7)	16 (6.4)	
Unspecified/other	216 (19.9)	173 (20.6)	43 (17.2)	
Inpatient ward				$\chi^2(3) = 5.875$, $P = 0.118$; Cramer's $V = 0.073$
Pediatric 1	579 (53.2)	461 (55.0)	118 (47.2)	
Pediatric 2	370 (34.0)	277 (33.1)	93 (37.2)	
Neonatal	93 (8.5)	65 (7.8)	28 (11.2)	
Inpatient emergency	46 (4.2)	35 (4.2)	11 (4.4)	
Length of stay, days, median (IQR)	-	3 (3)	2 (2)	$U = 84,855.5$, $Z = -4.620$, $P < 0.001$; $r = 0.14$

^a Values are expressed as No. (%). HIS, Hospital Information System. All characteristics are reported at the DAMA-episode level. Percentages in the nationality columns were calculated within each nationality group. Abbreviations: DAMA, discharge against medical advice; IQR, interquartile range; r , effect-size measure.

among DAMA episodes involving Iranian children (628/838, 74.9%), whereas cost/insurance-related recorded reasons predominated among DAMA episodes involving Afghan children (127/250, 50.8%), followed by perceived recovery (105/250, 42.0%) (Table 3).

Among the 1,088 DAMA episodes, the prevalence of a cost/insurance-related recorded reason in the primary mutually exclusive classification was substantially higher in episodes involving Afghan children than in those involving Iranian children (child-clustered crude PR = 42.57, 95% CI 22.73 - 79.73; adjusted PR = 41.63, 95% CI 22.15 - 78.25; $P < 0.001$) after adjustment for sex, length of stay, reason for admission, and inpatient ward (Table S6 in the Supplementary File). The adjusted model included all 1,088 DAMA episodes, with no missing values for the outcome or

included covariates. In the parsimonious sensitivity model retaining nationality, sex, and length of stay, the association remained essentially unchanged (adjusted PR = 42.28, 95% CI 22.43 - 79.67; $P < 0.001$). Both the primary and parsimonious models converged without numerical warnings (Table S6 in the Supplementary File). A sensitivity analysis using an alternative perceived-recovery-priority hierarchy also yielded substantively similar nationality associations (crude PR = 39.27, 95% CI 18.40 - 83.79; adjusted PR = 39.96, 95% CI 18.54 - 86.16), compared with the corresponding estimates under the primary hierarchy (42.57 and 41.63, respectively) (Table S10 in the Supplementary File).

Separately from the mutually exclusive five-category classification, the original HIS reason entries were

Table 3. Distribution of HIS-Recorded Reasons Across Pediatric DAMA Episodes Overall and by HIS-Recorded Nationality, 2024 - 2025 ^a

HIS-recorded DAMA reason	Total episodes	Episodes involving Iranian children	Episodes involving Afghan children
Perceived recovery	733 (67.4)	628 (74.9)	105 (42.0)
Cost/insurance-related factors	137 (12.6)	10 (1.2)	127 (50.8)
Other factors	86 (7.9)	81 (9.7)	5 (2.0)
Treatment-related factors	85 (7.8)	78 (9.3)	7 (2.8)
Hospital-related factors	47 (4.3)	41 (4.9)	6 (2.4)
Total	1,088 (100.0)	838 (100.0)	250 (100.0)

^a Values are expressed as No. (%). All reasons are reported at the DAMA-episode level. Percentages in the nationality columns were calculated within nationality-specific DAMA episodes. Abbreviations: DAMA, discharge against medical advice; HIS, Hospital Information System.

examined at a granular level, with co-recorded reasons retained. Perceived recovery alone was recorded in 611 DAMA episodes involving Iranian children (72.9%). Among DAMA episodes involving Afghan children, 79 (31.6%) recorded high cost alone, while 45 (18.0%) included both high cost and perceived recovery among the recorded reasons (Table S9 in the Supplementary File). Multiple-reason codes were also more frequent among DAMA episodes involving Afghan children than among those involving Iranian children (21.2% vs 8.0%; child-clustered PR = 2.65, 95% CI 1.91 - 3.69; $P < 0.001$) (Tables S7 and S9 in the Supplementary File). Sensitivity analyses restricted to the first DAMA episode per child ($n = 1,066$) yielded closely similar findings for the five-category reason distribution, cost/insurance-related reasons, and multiple-reason coding (Table S7 in the Supplementary File).

4.2. Qualitative Findings

4.2.1. Caregiver Accounts

Among the six interviewed caregivers, visible improvement, such as reduced fever, improved feeding, fewer symptoms, or a calmer child, was described as indicating that hospitalization was no longer necessary. This sometimes coexisted with a limited understanding of the treatment plan or the risks of early departure: “No explanation was given. They just said, ‘Give the medications’” (IR-C2). Competing family responsibilities, including caring for other children and a lack of an alternative caregiver, were also described (Table S3 in the Supplementary File).

In the three caregiver-interview cases involving Afghan children, financial concerns were documented on DAMA forms, whereas apparent recovery was foregrounded during interviews. Lack of insurance was nevertheless acknowledged: “We do not have insurance because we do not have a residence card. But the child’s fever has stopped, and the child is well now. I want to take the child home and

care for the child myself” (AF-C6). Recorded and narrated reasons therefore differed in emphasis rather than being mutually exclusive.

4.2.2. Staff and Managerial Perspectives

Six interrelated qualitative categories were identified: financial and insurance conditions and support mechanisms; structural capacity, equipment, and access to services; communication, clinical decision-making, and physician role; inpatient environment, hoteling, cleanliness, and support services; family, social, cultural, and practical circumstances; and management processes, policies, and documentation (Table S4 in the Supplementary File).

Financial concerns were prominent in staff accounts involving uninsured children and in accounts referring to Afghan children, including hospitalization charges and limited social-work or charitable support. Apparent improvement was described as coinciding with increasing costs: “As soon as the initial symptoms improve, they take the child home because the costs increase” (P3).

Communication concerns included inconsistent explanations, changes in responsible physicians, delayed consultations or disposition decisions, and discontinuity in communicating the care plan. Staff also questioned the broad recording of perceived recovery: “The DAMA forms I enter are almost all recorded as perceived recovery. But who determines this perceived recovery? The child cannot say that” (P7).

Other concerns involved service availability, ward conditions, family and travel constraints, fragmented coordination, and limitations in the electronic capture and review of DAMA-related information.

4.3. Mixed-Methods Integration

The joint display compared quantitative findings with independently derived caregiver and staff categories to contextualize the observed patterns rather than to infer

Table 4. Joint Display Integrating Quantitative and Qualitative Findings^a

HIS Category or Cross-Cutting Issue	Quantitative HIS Finding	Caregiver Accounts	Staff and Managerial Accounts	Integrated Result
Perceived recovery	Most frequent recorded reason overall and dominant among episodes involving Iranian children	Visible improvement was described as indicating that hospitalization was no longer necessary. Afghan caregivers also emphasized recovery despite financial concerns documented on their DAMA forms	Staff distinguished visible symptom improvement from clinical recovery and described frequent use of perceived recovery in DAMA documentation	Convergence and expansion: perceived recovery was present across data sources and co-occurred with financial, communication, family, and environmental concerns
Cost/insurance-related factors	Most frequent recorded category among DAMA episodes involving Afghan children and uncommon among those involving Iranian children	In the three caregiver-interview cases involving Afghan children, caregivers acknowledged lack of insurance but emphasized apparent recovery in their interview explanations	Staff described lack of insurance, increasing hospitalization costs, and limited capacity of social-work services or charitable support to cover expenses.	Convergence with differing emphasis: financial concerns appeared across sources but were less strongly emphasized in caregiver interviews
Treatment-related factors	Included dissatisfaction, delayed interventions, prolonged hospitalization, and unresolved clinical decisions	Caregivers described limited explanations, uncertainty about treatment, and delayed consultations	Staff described variable physician communication, changes in the responsible physician, delays, and continuity problems	Expansion: interviews provided greater detail on communication, continuity, and clinical decision-making
Hospital-related factors	Relatively uncommon among the final HIS categories	Caregivers described crowding, patient mixing, infection concerns, cleanliness problems, and inadequate amenities	Staff reported unavailable services, repeated referrals, crowding, construction-related disruption, cleanliness concerns, and inadequate caregiver facilities	Expansion: environmental and service-related concerns were more prominent in interviews than in the HIS categories
Other factors	Included family, social, and practical reasons	Caregivers described responsibility for other children, lack of substitute caregivers, distance from home, and maternal caregiving demands	Staff described family responsibilities, travel constraints, and preference for follow-up elsewhere	Expansion: interviews clarified practical family and social factors that were less specifically represented in administrative records
Documentation and governance	Not a separate HIS category; granular entries could include multiple reasons, although one category was assigned for the primary analysis	Caregivers sometimes emphasized one explanation despite additional reasons recorded on the DAMA form	Staff described broad HIS categories, frequent recording of perceived recovery, limited electronic capture of accompanying information, and limited review and feedback.	Cross-cutting qualitative expansion: recorded and interview-emphasized reasons sometimes differed

^a HIS = Hospital Information System; DAMA = discharge against medical advice. HIS categories were mutually exclusive for quantitative analysis, whereas qualitative factors could overlap. Documentation and governance were treated as cross-cutting concerns rather than as HIS reason categories. No directly contradictory cross-source finding was identified; observed differences were classified as differing emphasis where appropriate. The quantitative and qualitative columns report source-specific findings, whereas the “Integrated result” column presents mixed-methods inferences generated by comparing the data sources.

causal relationships (Table 4). Perceived recovery and cost/insurance-related factors converged across sources but differed in emphasis. In the three caregiver-interview cases involving Afghan children, financial concerns appeared on DAMA forms and lack of insurance was acknowledged, while apparent recovery was emphasized during interviews. Interviews expanded the administrative categories by identifying overlapping communication, continuity, service, environmental, and family pressures. Documentation and governance emerged as cross-cutting issues.

4.4. Expert Prioritization

The eight experts ranked financial/insurance-related factors highest (Friedman mean rank 4.56), followed by hospital- and treatment-related factors (3.19 each), perceived recovery (3.00), and other family/social factors (1.06). Thus, the highest-ranked domain differed from the most frequent HIS category. Within-domain analyses identified hospitalization costs for uninsured migrant children, crowding and patient mixing, and mothers' sole-

caregiver role as the leading subfactors in their respective domains. These rankings reflect exploratory judgments from eight experts and indicate relative ordering only, not statistically significant pairwise differences or objective superiority (Table S11 in the Supplementary File).

4.5. Development of Expert-Informed Management Recommendations

The panel translated the integrated findings into expert-informed, time-bound strategies addressing early risk identification, financial and coverage barriers, clinically appropriate alternatives to DAMA, referral escalation, harm-reduction discharge and follow-up, documentation, environmental and family constraints, and university-level support (Table 5; Table S12 in the Supplementary File).

Because recorded cost/insurance-related reasons were concentrated among DAMA episodes involving Afghan children and the financial/insurance domain was ranked highest by the eight experts, the panel also developed an expert-informed three-stage pathway for uninsured Afghan children with identified financial vulnerability:

Table 5. Expert-Informed Priority Management Responses to Pediatric DAMA ^a

Priority Area	Core Management Response	Implementation Horizon	Mean Impact/Feasibility
Early identification and coordination	Activate an early DAMA-risk trigger and same-shift multidisciplinary review	Pilot: 0 - 30 days; scale-up: within 90 days	4.78 (High) / 4.67 (High)
Financial and coverage barriers	Assess payment and coverage barriers during the same shift and document the support decision	0 - 30 days	4.89 (High) / 4.78 (High)
Apparent improvement versus clinical readiness	Offer clinically safe alternatives approved by the treating team, rather than relying on information provision alone	0 - 30 days	4.67 (High) / 4.33 (Moderate-high)
Referral and service delays	Establish closed-loop consultation and escalation for DAMA-risk cases	0 - 90 days	4.56 (High) / 3.33 (Moderate)
Safe transition and continuity of care	Implement risk-stratified harm-reduction discharge and follow-up when DAMA proceeds	0 - 90 days	4.33 (Moderate-high) / 4.56 (High)
Documentation and organizational learning	Implement a minimum electronic DAMA dataset preserving caregiver-, nursing-, and physician-source fields, alongside denominator-based equity monitoring and monthly case review	0 - 90 days; ongoing	4.78 (High) / 4.89 (High)
Inpatient environment and family constraints	Address modifiable environmental and caregiving barriers through targeted operational changes	0 - 90 days	3.33 (Moderate) / 4.22 (Moderate-high)
University- and health-system-level support	Establish financial-support and referral agreements for needs beyond hospital authority	3 - 12 months	4.56 (High) / 2.44 (Moderate-low)

^a DAMA, discharge against medical advice. Expected impact and feasibility were rated separately on five-point scales. Mean ratings were classified as low (1.00 - 1.49), moderate-low (1.50 - 2.49), moderate (2.50 - 3.49), moderate-high (3.50 - 4.49), or high (4.50 - 5.00). These ratings represent expert judgments and do not indicate observed intervention effects.

provisional hospital support after standardized assessment, a pre-committed pooled charity mechanism, and university-level protection for costs exceeding hospital and charity ceilings (Table S13 in the Supplementary File).

5. Discussion

This study identified two nationality-related patterns: the risk of DAMA was approximately threefold higher among discharge episodes involving Afghan children, whereas among DAMA episodes, recorded cost/insurance-related reasons were more prevalent in episodes involving Afghan children, and perceived recovery predominated among those involving Iranian children. Quantitative analyses identified nationality-related differences in DAMA occurrence and HIS-recorded reasons. Qualitative interviews provided contextual evidence regarding financial, family, communication, and service-related pressures, and their co-occurrence with apparent improvement emerged through mixed-methods integration. The eight experts subsequently ranked cost/insurance-related factors highest.

5.1. Nationality-Related Differences in Pediatric DAMA

The higher occurrence of DAMA among episodes involving Afghan children should not be attributed to nationality or culture. Nationality was used only to define the administrative comparison groups. Iranian nationality was recorded from national identification documents, whereas Afghan nationality was based on caregiver report; therefore, some misclassification of the latter cannot be

excluded. Episodes involving children recorded as Afghan should not be interpreted as representing a homogeneous group with respect to migration status, documentation status, insurance eligibility, or financial vulnerability. Registered refugees with eligible documentation may enroll in Iran's Universal Public Health Insurance (UPHI) scheme, whereas undocumented migrants are not eligible for this refugee insurance pathway and may consequently face greater financial barriers (15, 17, 18). Because documentation status and comparable child-level clinical and socioeconomic covariates were unavailable, these subgroups and potential differences in case mix could not be fully assessed. Residual confounding therefore remains possible, and the observed association should not be interpreted as a causal effect of nationality. Because the cost/insurance analysis was restricted to DAMA episodes, it does not establish that financial or insurance barriers caused or explained the higher overall DAMA occurrence among episodes involving Afghan children. Accordingly, the reported risk estimates refer to discharge episodes rather than to the proportion of unique children experiencing DAMA. Although the cost/insurance association remained stable in the parsimonious sensitivity analysis, the small number of cost/insurance-related episodes among Iranian children and sparse outcome counts in some covariate strata limited the precision of the estimated prevalence ratio.

The greater frequency of recorded cost/insurance-related reasons among episodes involving Afghan children is consistent with Iranian studies reporting legal, financial, informational, and administrative barriers to healthcare

access among Afghan migrants, with greater barriers reported among those lacking insurance or formal documentation (15, 16, 18). This administrative pattern is also consistent with the concept of structural vulnerability, whereby families' ability to continue care may be constrained by legal, economic, and organizational conditions (19). Financial pressures have likewise been reported in studies of pediatric DAMA in resource-constrained settings (6-8). Directly comparable evidence remains limited; however, higher DAMA rates were reported among culturally and linguistically diverse children in Australia (20). The difference between the two groups therefore extended beyond DAMA occurrence to the pattern of recorded reasons.

The association between nationality and cost/insurance-related recorded reasons was consistently large across the primary and sensitivity analyses. However, only 10 DAMA episodes involving Iranian children had a cost/insurance-related recorded reason, compared with 127 episodes involving Afghan children; consequently, the confidence intervals were wide, and the exact magnitude of the prevalence ratio remains uncertain. The 50.8% figure therefore represents the proportion of DAMA episodes involving Afghan children with a recorded cost/insurance-related reason, not the prevalence of financial vulnerability among Afghan children. Accordingly, the estimate reflects a substantial disparity in the prevalence of a recorded cost/insurance-related DAMA reason and should not be interpreted as indicating that families were approximately 42 times more likely to have actually experienced financial barriers. Median length of stay was also one day shorter among DAMA episodes involving Afghan children, but the effect size was small; without information on disease severity or stage of treatment, its clinical significance remains unclear.

5.2. Interpreting Perceived Recovery as an HIS-Recorded Reason

"Perceived recovery" was the most frequently recorded reason, particularly in episodes involving Iranian children. Caregivers in the interview sample described a fall in fever, improved feeding, or a calmer child as signs that continued hospitalization was no longer necessary. Studies from Tehran, eastern Ethiopia, and Saudi Arabia have likewise reported parents' perception of improvement as an important or common reason for pediatric DAMA (21, 25, 26). Despite methodological differences, the recurrence of this finding across settings suggests that caregivers may interpret perceived improvement as a sufficient reason to end hospitalization.

In the present study, however, perceived recovery did not always capture the full context of the decision. In the three caregiver-interview cases involving Afghan children,

financial concerns and lack of insurance were documented on the DAMA forms, whereas caregivers placed greater emphasis on the child's improvement during the interviews. This overlap was also evident in the administrative data: multiple-reason codes were 2.65 times as prevalent among DAMA episodes involving Afghan children as among those involving Iranian children (21.2% vs 8.0%), indicating more frequent co-recording of multiple reasons, although this may also reflect documentation practices. One possible explanation is that visible improvement makes continued hospitalization seem less necessary when remaining in care has also become financially or practically difficult. This is consistent with evidence that pediatric DAMA can reflect overlapping clinical, financial, family, and communication-related factors rather than a single isolated reason (2, 21, 27). Interpreting "perceived recovery" requires attention to the source and clinical meaning of the recorded reason. In this study, DAMA reasons entered into the HIS originated from caregivers' statements on the DAMA form rather than from an independent assessment by HIS personnel. Thus, "perceived recovery" represented caregiver-perceived improvement, not clinician-confirmed recovery or medical readiness for discharge. Caregivers described visible changes, such as reduced fever, improved feeding, fewer symptoms, or a calmer child, as indicating that hospitalization was no longer necessary, whereas staff questioned whether such observable improvement should be equated with clinical recovery. This distinction is important because caregiver-perceived symptomatic improvement and clinician-assessed readiness for discharge are conceptually different judgments.

5.3. Service-Delivery Factors: Communication, Continuity, and the Inpatient Care Environment

Interviews with caregivers and staff raised concerns about inconsistent explanations, changes in the physician responsible for care, delays in consultations or treatment decisions, limited access to some services, repeated referrals, and ward conditions. In some cases, caregivers and clinicians may not have shared the same understanding of the child's clinical status or the need for continued inpatient care.

Similar concerns have been described in the pediatric DAMA literature, including poor communication and the need for clear discussion of clinical risks and available alternatives (2-4). A signed DAMA form cannot replace a clear discussion with the family. The mixed-methods study from eastern Ethiopia also reported communication gaps, prolonged hospitalization, dissatisfaction with care, preference for treatment elsewhere, and limited family support (21). In Nigeria, a qualitative study drew attention

to the hospital environment, communication with staff, staff attitudes, and caregiver burden (28).

In our study, service and environmental concerns were more evident in the interviews than in the HIS categories. They were usually described alongside financial pressure, caregiving responsibilities, uncertainty about treatment, or perceived improvement in the child's condition. Taken together, these findings suggest that such concerns were unlikely to have acted alone; rather, they may have contributed to an already developing decision to leave the hospital.

5.4. Recorded Frequency, Organizational Priority, and Management Implications

A key implication of the integrated findings was that the frequency with which a reason was documented did not necessarily reflect its managerial priority. The HIS data identified the most commonly recorded reasons for DAMA, the nationality-stratified analysis demonstrated how these patterns differed between DAMA episodes involving Iranian and Afghan children, and the expert ratings indicated which areas were considered most important for intervention. Although perceived recovery was the most frequently documented reason, the eight experts ranked cost- and insurance-related factors highest. Managerial responses should therefore not be determined solely by the frequency of recorded reasons but should be matched to the principal problem identified in each case. Hospital decision-making involves multiple groups, including managers, physicians, nurses, and boards of directors, with their relative influence varying by the issue under consideration (29).

When caregivers request DAMA because the child appears to have improved, clinicians should explain the distinction between symptomatic improvement and clinical readiness for discharge while clearly communicating the remaining risks and available care options (3, 4). When financial or insurance-related difficulties are identified, early assessment by social-work services and timely access to hospital-, charitable-, or university-level support are important. Evidence from Iran describing high out-of-pocket expenditure and fragmented financial support for undocumented migrants supports consideration of more coordinated or pooled financing arrangements (30).

Electronic DAMA documentation should preserve the source distinctions already present on the paper form by separately capturing caregiver-stated reason(s), nursing documentation, and the treating physician's assessment, while retaining structured administrative coding for monitoring and analysis. When discharge proceeds despite preventive efforts, a harm-reduction plan should provide

essential treatment, warning signs, a clear return pathway, and appropriate follow-up (3, 4). These expert-informed strategies were derived from the integrated findings and expert judgment but have not yet been evaluated in clinical practice. Future research should therefore assess their feasibility, costs, implications for equitable access, potential unintended consequences, and effects on DAMA rates and post-discharge outcomes.

5.5. Study Limitations

This single-center retrospective study relied on routine HIS data, limiting generalizability to other pediatric hospitals in Tehran or Iran. Because DAMA ascertainment relied on the routine HIS discharge-status field, episodes not coded as DAMA in the HIS could not be independently identified, and some misclassification or under-ascertainment cannot be excluded. Recorded caregiver-stated reasons may not capture the full context or relative importance of concurrent motivations. Hierarchical recoding of co-recorded reasons into one mutually exclusive category may have obscured their relative prominence; the resulting categories should therefore be interpreted as analytic classifications rather than causal mechanisms. Because HIS-reason mapping was based on joint review and consensus without independent pre-consensus coding, inter-rater agreement could not be estimated. Comparable child-level data on age, insurance status, clinical severity, socioeconomic circumstances, and documentation- or migration-related factors were unavailable for non-DAMA episodes, limiting case-mix adjustment and leaving residual confounding possible. The cost/insurance PR was based on only 10 episodes involving Iranian children and sparse outcome counts in some strata; despite stability across sensitivity analyses, its exact magnitude remains uncertain. Some children contributed repeated episodes; child-clustered GEE and first-episode sensitivity analyses addressed within-child dependence, but estimates remain episode-level.

The qualitative component included a small purposive sample of six caregivers (three per nationality-defined group) and seven staff, and saturation was not claimed. Findings should therefore be interpreted as contextual insights rather than comprehensive accounts of either group or explanations for the magnitude of the nationality-related difference. Eligibility required direct participation in Persian without an interpreter. Although all approached caregivers could participate in Persian, the study did not systematically screen all potentially eligible caregivers for language proficiency; those with limited Persian may therefore have been underrepresented, introducing language-based selection bias and potentially underrepresenting communication or access barriers.

Interviews conducted after DAMA initiation but before hospital departure were susceptible to social-desirability or decision-justification bias, potentially leading caregivers to moderate criticism or frame their accounts in ways that justified an already initiated decision to leave. The prioritization survey included only eight purposively selected experts whose organizational and professional perspectives may have influenced the rankings. These rankings are exploratory and context-specific rather than objective evidence of the relative importance of intervention domains. The resulting strategies were expert-informed but not prospectively evaluated; their feasibility, effectiveness, and transferability remain uncertain.

5.6. Future Research

Future multicenter qualitative studies with larger and more diverse caregiver samples should examine experiences across nationality-defined groups while also characterizing insurance, documentation, language, and socioeconomic circumstances. Multicenter quantitative studies should also collect comparable measures of clinical severity, treatment stage, and diagnosis-based case mix for DAMA and non-DAMA episodes to permit more precise adjustment.

5.7. Conclusions

Pediatric DAMA showed marked nationality-related differences in both occurrence and recorded reasons: DAMA was more frequent among episodes involving Afghan children, with cost/insurance-related reasons more concentrated in this group, whereas perceived recovery predominated among episodes involving Iranian children. Mixed-methods integration showed that apparent recovery could coexist with financial, family, communication, and service pressures; subsequent expert prioritization indicated that the frequency of recorded reasons did not necessarily correspond to the domains ranked highest by the experts. HIS-recorded nationality should not be treated as a proxy for migration or documentation status, insurance status, or financial vulnerability. In similar settings, these proposed, expert-informed strategies may be considered context-specific priorities for prospective evaluation, including communication about clinical readiness, early need-based financial assessment, timely support, and clearer source-specific electronic documentation.

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Supplementary Material

Supplementary material(s) is available [here](#) [To read supplementary materials, please refer to the journal website and open PDF/HTML].

Footnotes

AI Use Disclosure: During manuscript preparation and revision, ChatGPT (OpenAI) was used for Persian-to-English translation, language and academic-style refinement, improving clarity and organization, and condensing selected sections, including the Discussion. All AI-assisted text was reviewed and revised by the authors to ensure fidelity to the original meaning and scientific content. No confidential or directly identifiable patient information was entered into the system. The authors retained full responsibility for the accuracy, integrity, and final content of the manuscript.

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