

ORIGINAL ARTICLE

DISCHARGE AGAINST MEDICAL ADVICE IN EMERGENCY DEPARTMENT HOSPITAL UNIVERSITI SAINS MALAYSIA: ASSOCIATED FACTORS, REASONS, AND SHORT-TERM FOLLOW-UP RATE

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ABSTRACT

Discharge against medical advice (DAMA) is a topic of global study. However, research on DAMA within Malaysian emergency departments (EDs) is limited. This study examines DAMA prevalence, associated factors, causes, and short-term follow-up rates. This was a prospective case-control study involving 264 patients (88 cases and 176 controls) at the ED of Hospital Universiti Sains Malaysia (HUSM) over a three-month period. Consent was obtained for phone interviews conducted a few days after the discharge of DAMA patients to determine 72-hour follow-up rates and the reasons behind DAMA. DAMA's prevalence was 6.36 per 1000 patients in the ED. The odds of having DAMA increased by 8% for each year of age (AOR: 1.08, 95% CI: 1.01 - 1.17), and the likelihood of DAMA was lower for females compared to males (AOR: 0.27, 95% CI: 0.12 - 0.62). In the interaction effect between age and triage, the odds of DAMA were 9% lower in green zone patients with increasing age (AOR: 0.91, 95% CI: 0.83 - 0.99) compared to red zone patients. DAMA was 35% higher in green zone patients with an increasing length of stay in ED (AOR: 1.35, 95% CI: 1.00 - 1.82) than red zone patients. One-fifth of DAMA patients returned for short-term follow-up, with most others reported to be fine. The most stated reason for DAMA was relief of symptoms or feeling well. DAMA was found to be associated with increasing age, male patient, and interaction of triage factor to the age and length of stay in the hospital. Although the prevalence of DAMA was low, tailored findings from the studied facility may warrant prompt improvisation.

Keywords: discharge against medical advice, emergency department, DAMA

INTRODUCTION

Patient care has always centred around quality care for both patients and the environment. In traditional healthcare settings, both providers and patients have viewed patient disagreements and decisions against medical advice as negative outcomes. DAMA cases in the ED increase the liability risks for emergency medicine physicians because they often involve severe underlying pathologies¹. DAMA refers to situations where patients opt to leave the hospital against medical advice². Previous studies have reported discharge against medical advice rates ranging from 1.44% to 51%, with higher rates observed in developing countries³⁻⁵.

The ED, serving as the primary point of contact for new cases in the hospital, handles a significantly higher volume of patients compared to other hospital departments. When we examine the proportion of DAMA cases specifically within the ED and compare it to the total number of DAMA cases

across the entire hospital, we discover that it can represent a substantial portion, potentially reaching as high as 58.2%. To provide context, this percentage signifies the portion of DAMA cases occurring in the ED in relation to all DAMA cases happening throughout the entire hospital. It's worth noting that the earliest report on DAMA rates in the ED was as low as 0.1%, while other studies have reported rates as high as 20% in ED settings⁸.

In a prospective survey conducted at a tertiary state hospital, the study found an incidence rate of 2.1% for DAMA cases⁹. Unfortunately, no data pertaining to DAMA in EDs in this country were found. In an urban setting, several factors such as payment methods, family obligations, and work problems were identified influencing DAMA decision-making¹⁰.

Multiple studies have linked DAMA to increased rates of morbidity, mortality, and readmission⁵⁻¹¹. Furthermore, multiple studies have focused on examining 72-hour 'bounce back' patients as a quality indicator¹²⁻¹³. Among DAMA patients, 35%

returned to the ED or primary care physician within 72 hours, with over half of them reported unchanged or worsened symptoms¹⁴.

The factors contributing to DAMA vary across communities and settings. DAMA has been associated with higher education, higher income, being male, younger age, having medical insurance, and urbanisation¹⁵. Different population studies have shown that DAMA is also linked to rurality and lower levels of education³. Furthermore, provider variables play a role as well, with factors such as patient orientation to hospitalisation, inability to establish a supportive provider-patient relationship, treatment dissatisfaction, and long waiting times being associated with DAMA⁶⁻⁸.

Since the reasons behind DAMA can vary between centers, DAMA on specific targets is better acquired and explained subjectively, providing for a more detailed and personalised concerns of the study population. This study aims to examine the prevalence of DAMA, the follow-up rate, and the associated factors and reasons for DAMA in an ED that sees an annual presentation cases ranging from 50,000 to 60,000, on Peninsular Malaysia's east coast. Importantly, this region has not previously undergone investigation with regard to DAMA. However, it should be noted that while there might be prior studies on DAMA in other regions of Malaysia or in different healthcare settings, they may remain unpublished or may not provide insights into the specific dynamics of this region.

METHODS

This was a prospective observational unmatched case-control study conducted from June 2019 to August 2019 in the ED at HUSM. The source population in this study consisted of all patients visiting ED HUSM during the study period, totalling 19033 patients. From a total of 121 cases of DAMA, 88 samples were randomly selected as cases, and 176 controls were selected from the non-DAMA patient group. The exclusion criteria were those under 18 years of age, call-not-attended cases, and patients with psychiatric problems.

DAMA cases from all zones were identified by working staff, documented in the registry book, and informed to the investigator. After DAMA, a follow-up telephone call was conducted from Day 4 to Day 5. During these calls, three open-ended questions were asked to the patients regarding any follow-up visit to any healthcare facility within 72 hours after DAMA, their further disposition, and the reason for DAMA if not stated in the case note. For non-DAMA

cases, the unmatched control group was randomly selected from the registry book from all zones, in a 1:2 control ratio.

Descriptive analysis was used to determine prevalence, short-term follow-up rates, and reasons for DAMA, and the results were presented in frequency (n) and percentage (%). Multivariable logistic regression was used to identify DAMA-associated factors and presented in odds ratios with 95% confidence intervals (CI). Variable selection for the analysis was done using both forward and backward logistic regression methods, and manual selection based on level of p-value <0.25.

RESULTS

Out of the total number of patients, the prevalence of DAMA was found to be 6.36 per 1000 population during the study period. Sociodemographic characteristic comparisons between DAMA and non-DAMA groups showed significant differences in several characteristics, including age, length of stay, gender, triage zone, and attendance of registrar or specialist (ARS). DAMA cases were predominantly male (n=69.32%), while non-DAMA cases were mostly female (n=55.68%). The mean age for DAMA patients was 49.86 (SD 17.43) and non-DAMA patients was 41.41 (SD 17.16). DAMA patients stayed longer in the ED, with a mean of 6.59 hours, compared to non-DAMA patients, who had a mean stay of 4.48 hours. Most DAMA cases were triaged to the yellow zone (67.05%), while most non-DAMA patients were triaged as green (62.5%) for the non-DAMA group. A higher percentage of DAMA cases were attended by a registrar or specialist (64.77%) compared to non-DAMA patients (32.34%). Characteristics such as citizenship, place of residence, holiday factor, and payment type showed no significant differences.

Table 2 demonstrates the rate of seeking short-term follow-up care among DAMA patients in healthcare facilities. Most of the DAMA patients did not pursue further follow-up (62.23 %), of whom 11.3% passed away within 72 hours post-DAMA. Among DAMA patients who seek short-term follow-up care, most of them (63.16%) were admitted.

Table 3 demonstrates the multivariable logistic regression table, which highlights the associated factors of DAMA among patients in ED. Based on the study, few statistically significant factors were identified, including age, length of stay, citizenship, gender, triage zone, marital status, ARS, age: triage zone, and length of stay (LOS): triage zone.

Table 1: Sociodemographic and characteristics comparison between DAMA and Non-DAMA groups

Characteristic	DAMA		NON-DAMA		p-value
	n (%)	Mean (SD)	n (%)	Mean (SD)	
Age	88	49.86 (17.43)	176	41.41(17.16)	<0.001
Length of stay (hour)	-	6.59 (5.06)	-	4.48 (4.23)	0.008
Citizenship					
Malaysian citizen	82 (93.18)		173 (98.30)		
Non-citizen	6 (6.82)		3 (1.70)		0.07
Gender					
Male	61 (69.32)		78 (44.32)		
Female	27 (30.68)		98 (55.68)		<0.001
Place of Residence					
Far (>15 km)	33 (37.50)		54 (30.68)		
Near (<15 km)	55 (62.50)		122 (69.32)		0.331
Circadian Variation					
AM Shift	27 (30.68)		58 (32.95)		
PM Shift	39 (44.32)		68 (38.64)		0.744
Night Shift	22 (25.0)		49 (27.84)		
NA	-		1 (0.57)		
Holiday factor					
Weekdays	48 (54.55)		107 (60.80)		
Public Holidays/ weekends	40 (45.45)		69 (39.20)		0.401
Triage zone					
Red	12 (13.64)		12 (6.82)		
Yellow	59 (67.05)		54 (30.68)		<0.001
Green	15 (17.05)		110 (62.50)		
NA	2 (2.27)				
Marital Status					
Single/divorced/ widowed	12 (13.64)		44 (25.14)		
Married	76 (86.36)		131 (74.86)		0.08
Diagnosis					
Trauma	10 (11.36)		28 (15.91)		
Non-trauma	78 (88.64)		148 (84.09)		0.42
Type of Payment					
Personal	44 (50.0)		94 (53.41)		
Guarantee letter/Insurance	44 (50.0)		81 (46.02)		0.662
NA			1 (0.57)		
Attendance by Registrar/ Specialist					
Attended by registrar/ Specialist	57 (64.77)		57 (32.39)		
Not attended by registrar/ specialist	17 (19.32)		116 (65.91)		<0.001
NA	14 (15.91)		3 (1.70)		

Table 2: Rate of seeking short-term follow-up care among DAMA patients at healthcare facilities

	Total, n = 88	Criteria	n (%)
	Rate of seeking follow up	Yes, 19 (21.59)	Admit
Discharged			7 (36.84)
DAMA			-
No, 53 (62.23)		Passed away	-
		Alive	47 (88.68)
		Passed away	6 (11.32)
Unable to contact, 16 (18.18)			

Table 3: Associated factors of DAMA among patients in ED (N = 247)

Characteristic	Crude Odds Ratio (95% CI)	p-value	Adjusted Odds Ratio (95% CI)	p-value
Age	1.03 (1.02, 1.05)	< 0.001	1.08 (1.00, 1.17)	0.034
Length of stay (hour)	1.12 (1.04, 1.21)	< 0.001	1.07 (0.91, 1.27)	0.403
Citizenship				
Malaysian citizen	1			
Non-citizen	4.11 (0.98, 20.46)	0.058	1.29 (0.97, 17.20)	0.845
Gender				
Male	1			
Female	0.35 (0.195, 0.62)	< 0.001	0.27 (0.12, 0.62)	0.002
Place of Residence				
Far	1			
Close	0.79 (0.45, 1.42)	0.432	-	-
Circadian Variation				
AM Shift	1			
PM Shift	1.14 (0.61, 2.15)	0.677	-	-
Night Shift	0.79 (0.37, 1.64)	0.529	-	-
Holiday factor				
Weekdays	1			
Public Holidays/ weekends	1.21 (0.69, 2.09)	0.507	-	-
Triage zone				
Red	1		1	
Yellow	0.90 (0.37, 2.22)	0.82	102.3 (0.40, 26116.18)	0.102
Green	0.14 (0.051, 0.36)	< 0.001	61.32 (0.34, 6.27)	0.153
Marital Status				
Single/divorced/ widowed	1		1	
Married	2.20 (1.08, 4.89)	0.04	1.27 (0.38, 4.29)	0.703
Diagnosis				
Trauma	1			
Non-trauma	1.24 (0.58, 2.81)	0.594	-	-
Type of Payment				
Personal	1			
Guarantee letter/Insurance	1.01 (0.58, 1.74)	0.977	-	-
Attendance by Registrar or Specialist				
Attended by Registrar/Specialist	1		1	
Not attended by Registrar/Specialist	0.15 (0.076, 0.27)	< 0.001	0.56 (0.19, 1.64)	0.288
Age: Triage zone				
Red			1	
Yellow	-	-	0.95 (0.88, 1.03)	0.227
Green			0.91 (0.83, 0.99)	0.032
Length of stay: Triage zone				
Red			1	
Yellow			0.86 (0.69, 1.09)	0.214
Green			1.35 (1.00, 1.82)	0.049

Variable selection was done using forward and backward LR as well as manual selection (p-value <0.25). Model 1 included age, length of stay (LOS), gender, citizen, triage, marital status and ARS. In Model 2, age, LOS, gender, triage and ARS were included, while Model 3 comprised of age, LOS, gender, citizen, triage, marital, ARS, age: triage, and LOS: triage. The common confounder of age, LOS, gender, triage and ARS were included in all models.

There were significant interactions between the factors of triage and age, as well as triage and length of stay in the ED. Both interactions were included in the final model, Model 3 (Hosmer Lemeshow test, p-value=0.53). The classification table was 74.7% correctly classified and fit, with the area under the receiver operating characteristics (ROC) curve measuring 82.7%.

Based on the final model (Model 3), there were several significant factors associated with DAMA, including age, gender, and two-way interaction of age: triage and LOS: triage. Regarding the age factor, in every year increase of age, the odds of having DAMA increased by 8% (AOR: 1.08, 95% CI: 1.01 - 1.17, p-value = 0.034) when adjusted for the other factors such as LOS, gender, citizenship, triage, marital status and ARS.

As for the gender factor, the odds of having DAMA were 73% lower (AOR: 0.27, 95% CI: 0.12 - 0.62, p-value = 0.002) in female patients compared to male patients when adjusted for the other factors such as age, LOS, citizenship, triage, marital status and ARS. In terms of the interaction effect between age and triage, the odds of having DAMA were 9% lower (AOR: 0.91, 95% CI: 0.83 - 0.99, p-value = 0.032) for patients in the green zone as age increased, as shown in Figure 1, compared to red zone patients, when adjusted for the other factors such as age, LOS, gender, citizenship, triage, marital status and ARS.

In terms of the interaction effect of length of stay in ED and triage (Figure 2), the odds of having DAMA were 35% higher (AOR: 1.35, 95% CI: 1.00 - 1.82, p-value = 0.049) for patients in the green zone, interacting with an increasing LOS in ED, compared to red zone patients, when adjusted for other factors such as age, LOS, gender, citizenship, triage, marital status and ARS.

Table 4 demonstrates the reason categories and subcategories for DAMA among patients in ED. The most commonly expressed reasons for DAMA were relief of symptoms and feeling well, childcare problems, and general discomfort of staying in the hospital. Other reasons and classifications were as listed, mostly sourced from phone call interviews.

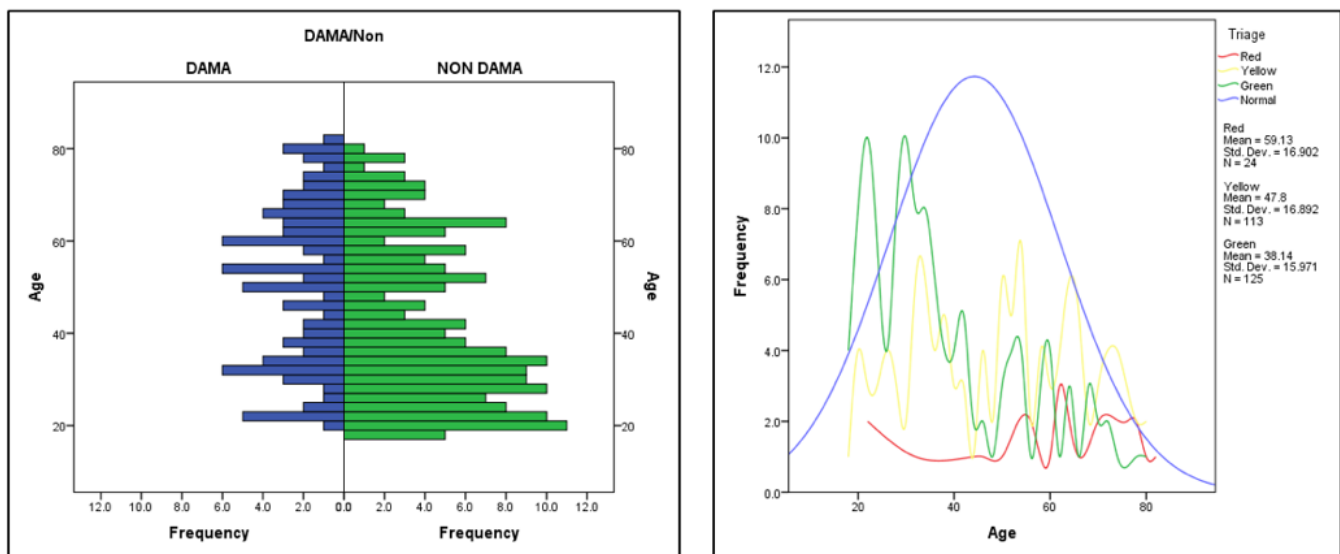


Figure 1: A pyramidal graph of DAMA versus non-DAMA according to age (left) and a line graph of age according to triage; red, yellow and green (right)

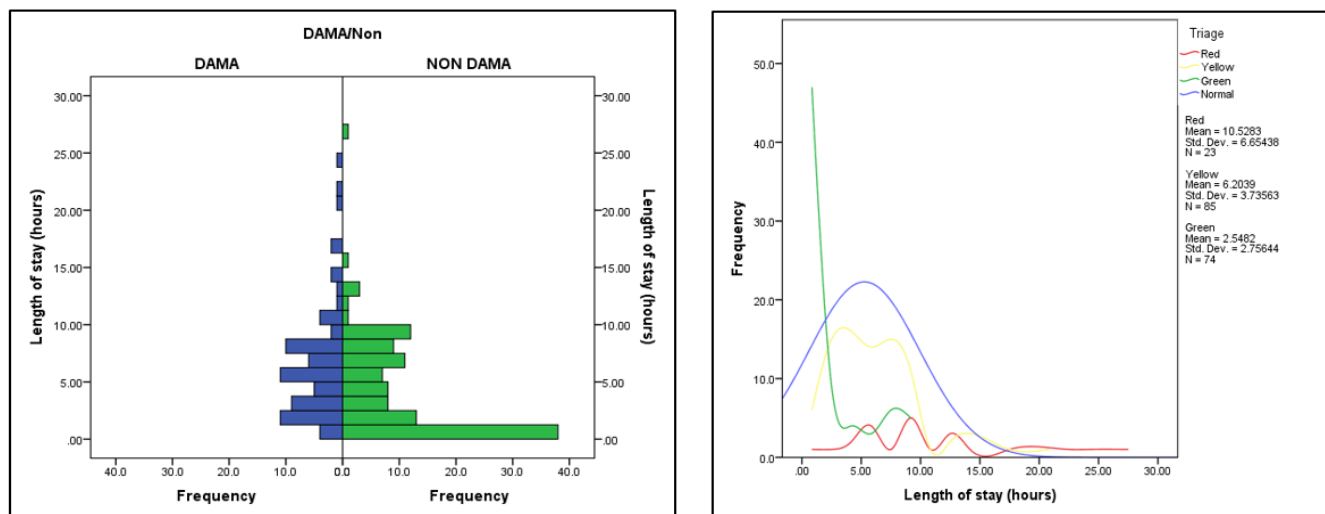


Figure 2: A pyramidal graph of DAMA versus non-DAMA according to the length of stay (left) and a line graph of length of stay according to triage; red, yellow and green (right)

Table 4: Reasons for DAMA among patients in ED

Variable	Sub-criteria	n (%)
Source	Phone call	50 (59.52)
	Case note	12 (14.29)
	Direct interview with the patient or attending doctor	22 (26.19)
Reason	Patient's socioeconomic related reason	
	Childcare problem	
	Work obligation	9 (10.59)
	Living far	5 (5.88)
	Financial problem	3 (3.53)
	Taking care of other unwell family members	3 (3.53)
	No family around	3 (3.53)
	Unprepared	1 (1.18)
	Symptom and disease-related reason	
	Relieved of symptoms or feeling well	12 (14.12)
	Poor prognosis	6 (7.06)
	Treatment experience-related reason	
	Long waiting time	2 (2.35)
	Refusal of surgical intervention	5 (5.88)
	General discomfort of staying in hospital	8 (9.41)
	Dissatisfaction with treatment	3 (3.53)
	Holiday related reason	
	Wanted to celebrate festivals at home	3 (3.53)
	Treatment center-related reason	
	Wanted to go to other private centers	7 (8.24)
Wanted to go to other government centers	1 (1.18)	
Wanted to go for alternative medicine treatment	2 (2.35)	
Others		
Other unmentioned	5 (5.88)	
Denied DAMA	2 (2.35)	
Not sure	2 (2.35)	

DISCUSSION

Anticipation and early identification of potential DAMA patients are important, given the increased liability for medical litigation¹⁶. Although DAMA rates in ED HUSM were found to be lower compared to recent studies in other populations in the west, the potential impact on patients and healthcare providers could be very significant, emphasising the critical need to focus on this group¹⁷⁻¹⁹. Considering other confounding factors, DAMA was associated with age, gender, and two-way interaction of age: triage and LOS: triage.

Our findings indicated that males had higher DAMA rates than females, with a mean age of 49, consistent with previous research in various regions^{10,18,20}. Interestingly, our data also highlighted that the yellow zone in our ED had a higher number of DAMA cases, most of which were attended by specialists or registrars for re-counselling in adherence to our ED HUSM standard practice. Moreover, in the context of urban Malaysia, it has been observed in one study that more DAMA cases occurred among patients triaged to critical areas compared to non-critical areas¹⁰. This trend could potentially be attributed to a higher prevalence of underlying health issues within this patient subgroup. It's noteworthy that in other studies, younger patients with shorter stays were shown to be more prone to DAMA, illustrating variations across healthcare centers^{19,21}.

Notably, our study did not identify payment method as a predictive factor for DAMA, as there were no significant differences among the groups. However, it's important to acknowledge that prior research has suggested that self-paying or uninsured patients tend to choose DAMA^{1,18}. In line with our findings, this implies that individual financial concerns significantly influenced DAMA decisions, highlighting the importance of healthcare providers addressing patients' financial worries and exploring available alternatives.

As age (year) increased, older patients in the red zone had a higher risk of DAMA compared to stable older patients in the green zone. Increasing comorbidities in an older age group with a poorer prognosis may contribute to this, redirecting the focus of treatment towards end-of-life care. Patients' and families' end-of-life care expectations may disfavour further hospitalisation despite deteriorating health. Patient and family decisions should always be respected, as long as adequate information, understanding, and assistance are provided. In contrast, younger patients triaged as green had a higher risk of DAMA than older patients. Patients with minor injuries

were more likely to choose DAMA over those with critical conditions¹⁸. To investigate specific concerns and issues in individualised centers, further patient satisfaction surveys may be needed. Based on these findings, young or middle-aged males triaged to green zone with long waiting times should be a target subgroup for future assessments and study improvements regarding DAMA, adequacy of information received, adequacy of assessment, and possible litigation issues.

Moreover, DAMA rates were 35% higher in green zone patients with an increasing length of stay in the ED (AOR: 1.35, 95% CI: 1.00 - 1.82) compared to red zone patients, particularly among young or middle-aged males. Patients triaged to the green zone, which generally indicates non-urgent conditions, may be more prone to DAMA when their length of stay in the ED becomes prolonged compared to patients in the red zone. They may feel frustrated, overlooked, or undervalued, leading to a higher inclination to DAMA. Green zone patients may perceive their condition as less urgent, causing them to question the necessity of longer waiting times. Consequently, they may weigh the inconvenience of a prolonged stay against the potential benefits of continued medical attention and decide to leave before completing their treatment. To address this issue, healthcare providers should prioritise timely and effective communication, manage expectations regarding wait times, and ensure appropriate attention and care are given to patients, regardless of their triage level.

Most DAMA patients in this study did not attend any short-term follow-up visits. The 72-hour return visit of DAMA patients was more or less equivalent at 21.6 % compared to 23.2 % of all ED visits, as reported in a previous study¹³. However, short-term follow-up was seen at a much lower rate (5%) in Taiwan¹². 11% of those who did not seek further follow-up passed away within 72 hours after DAMA. Still, this finding was expected, since all six cases studied here were due to poor prognosis, as detailed in subcategory Table 4. These findings suggest that the patient's perception of well-being and the decision to opt for DAMA will best benefit their expected short-term follow-up needs and expectations.

In many studies, dissatisfaction with treatment has been cited as a reason for DAMA^{8,19}. However, in this population, 'symptom relief and feeling well' emerged as the most common reason. This finding may explain the similar rate of short-term follow-up as those discharged per doctor's plan. According to a study in Malaysia, socioeconomic factors such as childcare and work obligations account for the

largest share of DAMA reasons¹⁰. Collaborative doctor-patient decisions on further treatment affect a patient's medical well-being. Previously, DAMA was viewed as a negative anecdote in the provider-patient relationship¹. However, looking at the trend in this setting, DAMA can be viewed as a respected healthy choice that can benefit both parties, especially the patients.

As most DAMA patients described feeling better, there is an opportunity for the ED to work closely with primary care providers. Collaborative efforts between ED physicians and primary care providers can facilitate seamless transitions and continuity of care for patients who choose DAMA but still require ongoing medical attention. This collaborative approach can ensure that these patients receive the necessary follow-up care and support in the primary care setting, potentially reducing the risk associated with DAMA.

This study population yielded both different and similar findings in comparison to the previous study. The strength of this study is its subjective approach to acquiring patient reasoning behind DAMA, as each patient's concerns are individual and unprompted. This study's findings showed that identifying subgroups of patients prone to DAMA improves our understanding of DAMA in ED HUSM. Other healthcare centers should consider using these methods for population assessment. A multi-angle view of associated factors, short-term follow-up conditions, and reasoning could help ED healthcare providers in other settings to better understand this target group, facilitating more specific quality improvement measures.

However, this study has several limitations. First, the study was conducted at a single center, which may limit the generalisability of the findings to other healthcare settings. Second, the study relied on self-reported data and patient interviews, which may be subjected to recall bias or social desirability bias. Third, the study did not explore factors such as mental health, behavioural diagnoses, substance co-ingestion, or intoxication intake, which could influence DAMA rates¹⁶. Future research should consider addressing these limitations and conducting multi-center studies to obtain a more comprehensive understanding of DAMA and its implications. A qualitative study could offer deeper insights into the subjective reasoning behind DAMA decisions. While our study utilised quantitative methods, incorporating qualitative approaches such as in-depth interviews or focus groups would provide a more comprehensive understanding of the complexities surrounding DAMA. These qualitative findings could inform tailored interventions and

strategies to address DAMA effectively in the ED setting.

CONCLUSION

The prevalence of DAMA in ED is low. DAMA was associated with an increase in age, male patients, and two-way interaction of age: triage and LOS: triage. One-fifth of DAMA patients returned for short-term follow-up, and most of those who did not seek short-term treatment reported feeling well. Reasons for DAMA were mostly socioeconomic in nature, with the most frequently expressed subcategory reason for DAMA being the relief of symptoms or feeling well. Although some of the study's results were comparable to other previous studies, each healthcare setting may have tailored findings that can prompt further improvisations in administration and practice by identifying associated factors, predictive characteristics, and increased understanding of DAMA.

Conflict of interest

The authors declare no potential conflict of interest.

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