 

ORIGINAL ARTICLE

# Discharge against medical advice and its relation to the length of stay and re-admission rates in the emergency department at King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia

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## ABSTRACT

**Objective:** This study aimed to identify the rate of discharge of hospitalized patients against medical advice (DAMA) and its risk factors, including length of stay and to assess patients' outcomes after signing DAMA.

**Methods:** This retrospective study included Saudi patients aged 14 years and above who were presented to the emergency department (ED) at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, and left against medical advice from January 2021 to March 2022. The patients were interviewed via phone calls to investigate the reasons for DAMA.

**Results:** The study included 186 DAMA patients, with 52.7% females and the majority (21%) falling in the 30-39 years category. The most common complaint was shortness of breath (13.4%). The prevalence of DAMA was 0.89%. The length of stay in the ED was the common reason for DAMA (60.7%). The length of stay varied, and the highest percentage of patients (31.2%) stayed in the ED for 2-3 hours. Outpatient treatment was the most common outcome after DAMA (41.4%). There was a significant association between insurance type, the reason for leaving the hospital, and the length of stay in the ED ($p = 0.001$ and $p < 0.001$, respectively). There was a significant association between the mode of presentation and outcome ($p = 0.002$).

**Conclusion:** The findings suggested that strategies aimed at reducing the length of stay in the ED and improving the continuity of care might help to minimize the incidence of DAMA and its adverse health outcomes.

**Keywords:** Discharge against medical advice, emergency department, patient, hospital, Saudi Arabia.

## Introduction

The discharge against medical advice (DAMA) of hospitalized patients is considered an adverse clinical event arising from a fundamental disagreement between the patient (or a concerned third party) and the attending physician and/or the hospital setting [1]. DAMA occurs in about 1%-2% of inpatient stays; however, this rate might escalate to 25.9% in specific centers [2,3]. The incidence of DAMA also depends on the department where the patient is admitted.

Studies have reported DAMA rates ranging from 6% to 54% for psychiatric admissions, while emergency admissions have a lower reported rate of 0.9% [4]. In previous Saudi studies, the prevalence of DAMA was approximately 1% among adult patients in the emergency department (ED) [5].

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Predictors of DAMA have been identified and can be classified into two broad categories. The first category includes patient variables such as socio-demographic characteristics, treatment history, diagnosis, attitudes, and behavior toward treatment. The second category includes provider variables, such as hospital setting, admission, discharge policies, staffing patterns, and physicians' experience and clinical style [6]. DAMA is commonly associated with younger age, male gender, lack of healthcare coverage, poor social support, and psychiatric illness [7].

Previous studies have mentioned other reasons why patients might request DAMA. These reasons include critically ill conditions of patients where survival is unlikely, dissatisfaction with the treatment received at the hospital, and competing family responsibilities [8]. Moreover, patients might request DAMA because they expect a shorter hospital stay, feel better, or prefer another hospital [9].

Patients with DAMA are at a higher risk of returning to the hospital due to the same or related issues [1,10]. Compared to routinely discharged patients, patients with DAMA are more than twice as likely to be readmitted within 1 month and more than three times as likely to return to the ED within a week [10]. On the other side, patients who request DAMA face a more significant burden of medical expenses due to re-admission [8].

A better understanding of the characteristics of patients who experience DAMA and the reasons that lead to it can facilitate the creation of solutions to minimize their adverse consequences, such as enhancing the continuity of care and increasing access to community-based services. Therefore, this study aimed to identify the rate of DAMA and its risk factors, including factors related to the length of stay in hours in the ED at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, as well as to assess patients' outcome after signing DAMA.

## Subjects and Methods

This was a retrospective descriptive study that aimed to identify the rate of DAMA and its risk factors, including factors related to the length of stay in hours, including patient's data admitted to the King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, from January 2021 to March 2022.

The study subjects were Saudi patients aged above 14 years who were presented to the ED at King Faisal Specialist Hospital and Research Center in Riyadh and left against medical advice. These patients were flagged in the electronic system as discharged against medical advice or left before treatment completion. The DAMA paper was signed by the patient or their families, scanned by word clearly, and placed in the patient's file. Any pediatric patients aged less than 14 years, protocol patients, patients with incomplete records, or who did not answer the calls more than three times were excluded.

All the included patients were interviewed through phone calls; even the patients who were motivated to sign DAMA were called to explore the reasons for DAMA. Data collected from the included patients was age, marital status, job, insurance type, educational level, patient category, comorbidities/chronic diseases, details of ED visits, history of previous admission or re-admission, the reason for leaving the hospital under treatment status, decision maker of DAMA, time of discharge, prior history of a DAMA within 1-year, post-discharge data.

Data were extracted into an Excel sheet and then revised. The statistical analysis was done using the computer program IBM SPSS (version 26.0, Armonk, NY). Categorical variables were described in numbers and percentages. The Chi-square test and Fisher's exact test were conducted to compare the different variables and the length of stay or outcome. $p$-values less than 0.05 were considered statistically significant.

## Results

The number of patients who visited the hospital in 2022 was 96,282, and those discharged against the medical advice were 864, with a rate of 0.89%.

The study included data from 186 patients discharged against medical advice. About half were females (52.7%). The age of the patients ranged from 14 to over 80 years, with the highest percentage (21%) falling in the 30-39 years age category. Most patients were married (64%), unemployed (38.7%), and had their medical expenses paid through their corporate insurance (63.4%). Educational qualifications varied, with the highest percentage (47.3%) completing higher education. Comorbidities were present in many patients, with diabetes mellitus and hypertension being the most common, affecting 25.2% and 22% of patients, respectively. The most common chief complaints of patients were shortness of breath (13.4%), abdominal pain (10.2%), and chest pain (9.1%) (Table 1).

Most patients self-presented to the ED (94.6%) and required urgent triage (65.6%). The length of stay or waiting time in the ED varied, with the highest percentage of patients (31.2%) staying in the ED for 2-3 hours and the lowest rates staying in the ED for less than 30 minutes (5.4%). Moreover, most patients (79%) were seen by a physician during their ED visit (Table 2).

Most patients (64.5%) had a history of a previous admission through the ED. Regarding re-admissions, only 31.7% of patients had a re-admission history within 30-60 days (Table 3).

Most patients mentioned leaving the hospital under treatment status due to long waiting times or an extended stay in the ED (60.7%). Other reasons reported were a long delay in diagnosis or therapeutic procedures (25.8%), followed by personal or family issues (24.7%), tiredness, and sadness of hospital ambiance (17.2%). Moreover, in most cases, patients were the primary decision makers for leaving the hospital against medical advice (91.4%). The highest percentage of patients left the hospital during the evening shift (48.4%). In addition, 20.4% of patients had a previous discharge history against medical advice within 1 year (Table 4).

The most common outcome after DAMA was outpatient treatment (41.4%), and other outcomes included re-admission to the same hospital (16.7%), followed by

*Table 1. Demographic characteristics of the patients (n = 186).*

| Parameters | Category | Frequency (*n*) | Percentage (%) |
|---|---|---|---|
| Gender | Male | 88 | 47.3 |
| | Female | 98 | 52.7 |
| Age | 14-29 | 35 | 18.8 |
| | 30-39 | 39 | 21 |
| | 40-49 | 29 | 15.6 |
| | 50-59 | 31 | 16.7 |
| | 60-69 | 22 | 11.8 |
| | 70-79 | 17 | 9.1 |
| | ≥80 | 13 | 7 |
| Marital status | Single | 56 | 30.1 |
| | Married | 119 | 64 |
| | Divorced | 3 | 1.6 |
| | Widowed | 8 | 4.3 |
| Job | Employed | 69 | 37.1 |
| | Unemployed | 72 | 38.7 |
| | Retired | 45 | 24.2 |
| Insurance type | Paid out-of-pocket | 3 | 1.6 |
| | Paid through corporate | 118 | 63.4 |
| | Paid using insurance | 65 | 34.9 |
| Educational qualification | Uneducated | 7 | 47.3 |
| | Primary | 9 | 4.8 |
| | Secondary | 16 | 8.6 |
| | High school | 66 | 35.5 |
| | Higher educational | 88 | 47.3 |
| Patient category | Dependent | 16 | 8.6 |
| | Employee | 13 | 7 |
| | Ordinary | 157 | 84.4 |
| Comorbidities | Diabetic mellitus | 47 | 25.2 |
| | Hypertension | 41 | 22 |
| | Cancer | 24 | 12.9 |
| | Hypothyroidism | 13 | 6.9 |
| | Asthma | 11 | 5.9 |
| | Cardiac disease | 11 | 5.9 |
| | Dyslipidemia | 7 | 3.7 |
| | None | 32 | 17.2 |
| Chief complaints | Shortness of breath | 25 | 13.4 |
| | Abdominal pain | 19 | 10.2 |
| | Chest pain | 17 | 9.1 |
| | Cough | 14 | 7.5 |
| | Fever | 14 | 7.5 |
| | Dizziness | 11 | 5.9 |
| | Vomiting | 6 | 3.2 |
| | Diarrhea | 6 | 3.2 |
| | Headache | 5 | 2.6 |
| | Others | 69 | 37 |

hospitalization in another hospital (11.8%), and being cured without any further treatment (9.1%). In addition, 38.2% of patients were represented in the ED within 30 days of their initial visit (Table 5).

The results showed a significant association between insurance type and length of stay in the ED ($p = 0.001$). Patients who paid out of pocket had a significantly shorter stay length than those who paid through corporate or insurance. There was also a significant association between the reason for leaving the hospital and the length of stay ($p < 0.001$). Patients who left the hospital due to long waiting times or a long stay in the ED had

*Table 2. Information about patients' ED visits (n = 186).*

| Parameters | Category | Frequency (*n*) | Percentage (%) |
|---|---|---|---|
| Mode of presentation | Self-presenting | 176 | 94.6 |
| | Emergency medical service | 10 | 5.4 |
| Triage category | Emergent | 19 | 10.2 |
| | Urgent | 122 | 65.6 |
| | Less urgent | 40 | 21.5 |
| | Non-urgent | 5 | 2.7 |
| Length of ED stay or waiting time | Less than 30 minutes | 10 | 5.4 |
| | 30 minutes to 1 hour | 36 | 19.4 |
| | 2-3 hours | 58 | 31.2 |
| | 4-5 hours | 44 | 23.7 |
| | More than 5 hours | 38 | 20.4 |
| Whether the physician saw the patient | Yes | 147 | 79 |
| | No | 39 | 21 |

ED: emergency department.

*Table 3. Details about the history of admission among patients (n = 186).*

| Parameters | Category | Frequency (*n*) | Percentage (%) |
|---|---|---|---|
| History of a previous admission through the ED | Yes | 120 | 64.5 |
| | No | 66 | 35.5 |
| History of re-admission within 30–60 days | Yes | 59 | 31.7 |
| | No | 127 | 68.3 |

*Table 4. Information about patients' decision to leave the hospital (n = 186).*

| Parameters | Category | Frequency (*n*) | Percentage (%) |
|---|---|---|---|
| Reason for leaving the hospital under treatment status | Long waiting times/a long stay in the ED | 113 | 60.7 |
| | A long delay in diagnosis, therapeutic procedures | 48 | 25.8 |
| | Personal/family issues | 46 | 24.7 |
| | Tiredness and sadness of hospital ambiance | 32 | 17.2 |
| | Lack of appropriate room | 26 | 13.9 |
| | Feeling well | 23 | 12.3 |
| | Dissatisfaction with hospital care | 19 | 10.2 |
| | Distance barriers | 15 | 8.1 |
| | Motivated to leave by a family member | 14 | 7.5 |
| | Conflicts with staff | 9 | 4.8 |
| | Not receiving adequate information | 7 | 3.7 |
| Decision makers | Patients | 170 | 91.4 |
| | Attendees | 16 | 8.6 |
| Time of DAMA | Morning shift | 50 | 26.9 |
| | Evening shift | 90 | 48.4 |
| | Night shift | 46 | 24.7 |
| Previous history of a DAMA within 1 year | Yes | 38 | 20.4 |
| | No | 148 | 79.6 |

ED: emergency department.

a significantly longer stay than those who left for other reasons. Other variables, such as gender, age, marital status, educational level, occupational status, mode of presentation, triage category, and whether a physician saw the patient, were not significantly associated with the length of stay in the ED (Table 6).

No significant association between gender, type of triage, length of stay, whether the doctor saw the patient, and the reason for leaving the hospital and outcome (death, no re-admission, and re-admission) were found. However, there was a significant association between the mode of presentation and outcome ($p$ = 0.002). Patients who

*Table 5. Post-discharge data of the patients (n = 186).*

| Parameters | Category | Frequency (*n*) | Percentage (%) |
|---|---|---|---|
| Outcome after DAMA | Outpatient treatment | 77 | 41.4 |
| | Re-admission to the same hospital | 31 | 16.7 |
| | Hospitalized in another hospital | 22 | 11.8 |
| | Cured without any further treatment | 17 | 9.1 |
| | Death | 17 | 9.1 |
| | Missing data | 22 | 11.8 |
| Represent to the ED within 30 days | Yes | 71 | 38.2 |
| | No | 115 | 61.8 |

ED: emergency department.

*Table 6. Association between patients' characteristics and length of stay in the hospital (n = 186).*

| Factors<br>Less than 1 hour | | Length of stay | | | Total | *p*-value |
|---|---|---|---|---|---|---|
| | | 2-3 hours | 4 hours or more | | | |
| Gender | Female | 30 (30.6) | 31 (31.6) | 37 (37.8) | 98 | 0.091 |
| | Male | 16 (18.2) | 27 (30.7) | 45 (51.1) | 88 | |
| Age | <50 years | 30 (29.1) | 27 (26.2) | 46 (44.7) | 103 | 0.161 |
| | ≥50 years | 16 (19.3) | 31 (37.3) | 36 (43.4) | 83 | |
| Marital status | Married | 28 (23.5) | 37 (31.1) | 54 (45.4) | 119 | 0.853 |
| | Unmarried | 18 (26.9) | 21 (31.3) | 28 (41.8) | 67 | |
| Educational level | High education | 22 (25) | 21 (23.9) | 45 (51.1) | 88 | 0.093 |
| | Lower educational level | 24 (24.5) | 37 (37.8) | 37 (37.8) | 98 | |
| Occupational status | Employed | 17 (24.6) | 20 (29) | 32 (46.4) | 69 | 0.860 |
| | Unemployed | 29 (24.8) | 38 (32.5) | 50 (42.7) | 117 | |
| Insurance type | Paid out-of-pocket | 2 (66.7) | 0 (0) | 1 (33.3) | 3 | **0.001** |
| | Paid through corporate | 21 (17.8) | 34 (28.8) | 63 (53.4) | 118 | |
| | Paid using insurance | 23 (35.4) | 24 (36.9) | 18 (27.7) | 65 | |
| Mode of presentation | Emergency medical service | 3 (30) | 4 (40) | 3 (30) | 10 | 0.641 |
| | Self-presenting | 43 (24.4) | 54 (30.7) | 79 (44.9) | 176 | |
| Triage category | Non-urgent | 1 (20) | 0 (0) | 4 (80) | 5 | 0.131 |
| | Urgent | 37 (22.8) | 52 (32.1) | 73 (45.1) | 162 | |
| | Emergent | 8 (42.1) | 6 (31.6) | 5 (26.3) | 19 | |
| Whether the physician saw the patient | Yes | 39 (26.5) | 45 (30.6) | 63 (42.9) | 63 | 0.540 |
| | No | 7 (17.9) | 13 (33.3) | 19 (48.7) | 39 | |
| Reason for leaving the hospital | Long waiting times/ long stay in the ED | 14 (12.4) | 34 (30.1) | 65 (57.5) | 113 | **<0.001** |
| | Other | 32 (43.8) | 24 (32.9) | 17 (23.3) | 73 | |

*P*-value in bold are significant at 0.05 level of significance.

arrived via emergency medical services had a higher re-admission rate than those who self-presented (Table 7).

## Discussion

DAMA is a prevalent issue in healthcare globally that can result in substantial morbidity, mortality, burden on the healthcare system, and elevated healthcare costs. Despite the extensive research on overcrowding in EDs worldwide, minimal attention has been given to documenting the prevalence of DAMA and its impact on patient outcomes and the healthcare system [11]. Thus, this study was directed to explore the rate of DAMA and its risk factors, including factors related to the length of stay in hours in the ED at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, as well as to assess patients' outcome after signing DAMA.

In this study, the prevalence of DAMA was 0.89% among the patients presented to the ED over 1 year. Another study in Saudi Arabia reported similar results, indicating that the rate of DAMA among patients was 1% through 1 year [5]. A study conducted in Spain found that the rate of DAMA from ED was from 0.07% to 0.7% [12]. On the other hand, a survey conducted in the USA revealed that the prevalence of DAMA in the ED ranges from 0.1% to 2.7% [13]. In addition, another study from Iran reported a higher DAMA rate in the ED of about 20%

*Table 7. Factors associated with outcome after DAMA (n = 186).*

| Factors<br>Death | | Outcome | | | Total | *p*-value |
|---|---|---|---|---|---|---|
| | | No re-admission | Re-admission | | | |
| Gender | Female | 6 (7.1) | 65 (76.5) | 14 (16.5) | 85 | 0.198 |
| | Male | 11 (13.9) | 51 (64.6) | 17 (21.5) | 79 | |
| Mode of presentation | Emergency medical service | 4 (44.4) | 2 (22.2) | 3 (33.3) | 9 | **0.002** |
| | Self-presenting | 13 (8.4) | 114 (73.5) | 28 (18.1) | 155 | |
| Triage category | Non-urgent | 1 (25) | 3 (75) | 0 (0) | 4 | 0.326 |
| | Urgent | 13 (9) | 104 (71.7) | 28 (19.3) | 145 | |
| | Emergent | 3 (20) | 9 (60) | 3 (20) | 15 | |
| Length of stay | Less than 1 hour | 1 (2.4) | 31 (73.8) | 10 (23.8) | 42 | 0.293 |
| | 2-3 hours | 8 (15.7) | 34 (66.7) | 9 (17.6) | 51 | |
| | 4 hours or more | 8 (11.3) | 51 (71.8) | 12 (16.9) | 71 | |
| Whether the physician saw the patient | Yes | 17 (12.9) | 90 (68.2) | 25 (18.9) | 132 | 0.093 |
| | No | 0 (0) | 26 (81.3) | 6 (18.8) | 32 | |
| Reason for leaving the hospital | Long waiting times/ long stay in the ED | 10 (10.4) | 68 (70.8) | 18 (18.8) | 96 | 0.998 |
| | Other | 7 (10.3) | 48 (70.6) | 13 (19.1) | 68 | |

*P*-value in bold are significant at 0.05 level of significance.

[14]. Consequently, current findings suggested that the rate of DAMA in the study region might be relatively less than in other areas of the world.

The patients who experienced DAMA in this study were slightly more likely to be female (52.7%). Similar findings were reported in a study from Pakistan (52%) [1]. In contrast, a study by Manouchehri et al. [15] concluded that the rate of DAMA in males was higher than in females.

A systematic review of 61 studies showed that young age predicts DAMA [16]. In the present study, most patients who experienced DAMA fell in the 30-39 years age category (21%). A survey by Hasan et al. [1] found that most patients who underwent DAMA had a median age of 45 years.

In the current study, the decision to DAMA was made mainly by patients (91.4%). In contrast, a prior survey indicated that only 40.7% of patients decided on DAMA [8].

The most common first-visit diagnosis for DAMA patients was related to shortness of breath and abdominal disorders. On the other side, prior studies revealed that gastrointestinal and cardiac disorders were the most frequent complaints for DAMA patients [11,17–19].

Usually, non-emergency cases were admitted to less urgent care at the ED and thus had shorter periods at the hospital. Conversely, patients needing emergency care were advised to stay longer at the hospital due to their critical condition [5]. Furthermore, a higher proportion of patients in this study were presented to urgent care (65.6%), similar to the results of El-Metwally et al. [5]. Another finding by Abuzeyad et al. [11] revealed that approximately all DAMA patients were urgent cases.

Extended stays at urgent care departments can increase overall patient expenses, which might be a financial burden. As a result, in such conditions, patients might choose to leave against medical advice [5]. In the present study, most patients reported that they left the hospital under treatment status due to long waiting times or a long stay in the ED (60.7%). In addition, patients who left the hospital due to long waiting times or a long stay in the ED had a significantly longer stay than those who left for other reasons ($p < 0.001$). The current results were aligned with a prior study, indicating that long waiting times were the most frequent reason for DAMA [20]. A previous study was inconsistent with the current findings and revealed that refusal of a procedure/operation was reported for most patients [11]. A cross-sectional study conducted in Iran studying patients who experienced DAMA revealed that among the top reasons for DAMA were personal issues and leaving for another facility [3]. Another survey showed that the most common reason for DAMA was financial constraints (40.6%) [1]. The other common reasons for DAMA identified in the current study included a long delay in diagnosis, therapeutic procedures, personal/family issues, tiredness, and sadness in the hospital ambiance.

Patients with DAMA are at a higher risk of developing complications and needing re-admissions [21]. After following up with the patients after discharge, it was indicated that about a third of them (38.2%) represented the ED within 30 days, and 9.1% died. Hasan et al. [1] found that 34% of patients who left signing the DAMA re-visited the hospital within 30 days. A previous study reported that 20.8% had returned to the ED within the first 72 hours [11]. Conversely, DAMA does not limit the treating doctor’s responsibilities toward the patients.

Despite the current study’s valuable findings, it had certain limitations. The data collection was based on medical records at the hospital, which resulted in some missing data.

## Conclusion

This study provides valuable insights into the characteristics of patients who leave the hospital against medical advice and the factors associated with their decision. The results indicated that long stays and waiting times in the ED were common reasons for DAMA. Patients who pay through corporate insurance and stay longer in the ED are more likely to leave against medical advice. These findings suggest that strategies aimed at reducing the length of stay in the ED and improving the continuity of care might help to minimize the incidence of DAMA and its adverse health outcomes. Further research is needed to investigate the impact of interventions targeting these factors on reducing the rate of DAMA and improving patient outcomes.

### List of Abbreviations

DAMA Discharge against medical advice
ED Emergency department

### Conflict of interests

The authors declare that there is no conflict of interest regarding the publication of this article.

### Funding

None.

### Consent to participate

At the beginning of the phone call, the research objectives were explained to the study subjects, and it was clarified that participation in the study was completely voluntary. Answering the data collector's questions during the phone call was considered as an approval to participate in the study.

### Ethical approval

Ethical approval was granted by the Ethics the Institution Review Board at King Faisal Specialist Hospital and Research Center in Riyadh, Saudi Arabia, via reference number: 2221054, dated 15/05/2022.

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