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ORIGINAL RESEARCH

Care Complexity Factors and Discharge Destination in an Emergency Department: A Retrospective Cohort Study

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Abstract: **Introduction:** Emergency department discharge destination is an important topic in both clinical practice and management. This study aimed to analyze the association of Care Complexity Individual Factors (CCIFs) with discharge destinations in patients who visit the emergency department (ED). **Methods:** This is a retrospective cohort study with consecutive sampling, including all patients who visited the ED of a tertiary hospital during 2021-2022. Data were collected from electronic health records. The main study outcomes were discharge destinations (mortality, intensive care unit admission, hospitalization, left without being seen/discharge against medical advice, and home discharge) and 26 CCIFs. Independent multinomial logistic regression was used for assessing the association of each factor and the discharge destinations, adjusted for age, sex, and triage level. All analyses were performed with R, version 4.3.2. **Results:** A total of 35,383 patients were included. Of these, 60.8% were home discharged, 34.1% were hospitalized, 2.6% were transferred to the intensive care unit, 2.1% were left without being seen, and 0.4% died. The presence of CCIFs was a risk factor of ED mortality (odds ratio (OR): 13.49 [95% confidence interval (CI): 4.99;36.46]), intensive care unit admission (OR:1.26 [95%CI:1.08;1.47]), and hospitalization (OR: 1.62 [95%CI:1.53;1.71]), whilst the presence of care complexity factors was a protective factor of discharge against medical advice (OR:0.64 [95%CI:0.55;0.74]). **Conclusion:** The discharge destinations from the ED showed strong associations with the patient's complexity factors. Health professionals should consider these relationships for the design of early detection strategies and as an aid in decision-making, to ensure equity and quality of care.

Keywords: Patient discharge; Risk factors; Emergency Service, Hospital; Patient outcome assessment; Quality of health care

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1. Introduction

Emergency department (ED) discharge destinations are an important topic in both clinical practice and management (1, 2). The decision of where a patient will go after the ED additionally entails an expenditure of material and human resource expenses (3, 4). This decision is determined by multiple factors including the severity of the patient's condition and evolution, the resources available, and the specific needs of each person, such as their fragility or complexity (5-7). For this reason, aligning resources and ensuring equity and quality in health care is a priority of public administrations (8).

Numerous authors have proposed models to predict admission to hospitalization units or the mortality of patients in the ED. However, most are limited to considering clinical aspects, such as the pathology of admission or the patient's vital signs, along with specific demographic variables such as age or comorbidities (9). A clear example is the widespread use of scales such as the Clinical Frailty Scale or the Charl-

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son scale, which do not consider all aspects of the patient (7, 10). However, there are few studies that have analyzed patient complexity holistically-that is, considering not only the biological sphere, but also others, such as, the socioeconomic and cultural spheres (11-13).

Currently, there are different tools to assess the overall complexity of patients, such as care complexity individual factors. Care complexity individual factors (CCIFs) are a set of characteristics related to different health dimensions that may complicate care delivery (14). They are grouped into five sources of complexity (biological, developmental, psychoemotional, sociocultural, and mental-cognitive). Although previous studies have shown their association with adverse events, mortality, and hospital readmission (11, 12, 15), their impact on health outcomes in patients treated in the ED has not been properly evaluated. In addition, the studies published to date identified the different discharge destinations independently or without considering patients who left without being seen (LWBS) (9, 16) and have not offered a global view of the trends behind urgent care.

Understanding the discharge process regardless of patients' destination after the ED and knowing the risk factors associated with it, is crucial for creating strategies to improve care and optimize the management of resources. This is especially relevant in EDs, where overcrowding is frequent and growing (17).

We aimed to provide information on the discharge destinations of patients from the ED and to identify the CCIFs associated with them. A key contribution of our approach is that we address the ED patient from the biological, psychoemotional, sociocultural, and mental spheres, with the intention of identifying patterns and trends in different discharge destinations. The main objective of the study was to analyze the association of CCIFs with discharge destinations (mortality, intensive care unit admission, hospitalization, left without being seen [LWBS]/discharge against medical advice [DAMA], home discharge) in patients who were treated in the ED.

2. Methods

2.1. Study design and setting

This is a retrospective cohort study with consecutive sampling method. All patients who visited the ED of Bellvitge University Hospital, Barcelona, Spain, from June 1, 2021, through June 30, 2022, were included. Patients were classified according to discharge destinations (ED mortality, intensive care unit (ICU) admission, hospitalization, LWBS/DAMA, and home discharge).

The Bellvitge University Hospital is a tertiary care center located in the southern metropolitan area of Barcelona, Spain. It is the community referral hospital for more than 200,000 inhabitants and is a reference center in processes that require advanced technology for more than two million inhabitants. This hospital has an ED equipped with five modules and 120 treatment rooms, and it attends approximately 118,000 patients annually. In addition, this department handles urgent cases of any specialty, except pediatrics and obstetrics (18).

This study adhered to the Strengthening the Reporting of Observational Studies in Epidemiology guidelines. The study was conducted in accordance with current regulations and was approved by the institutional review board of Bellvitge University Hospital on April 26, 2022 (Ref. PR051/22). A person outside the research team assigned a numerical code to each patient episode in the database to pseudonymize all data and preserve confidentiality. Data were collected retrospectively from the electronic health record; therefore, the need for informed consent was waived by the institutional review board.

2.2. Participants

All patients who visited the ED during the study period and had a nursing care plan in the electronic health record were included. Patients under 16 years of age were excluded because most of them were transferred to other hospitals. In addition, we excluded patient records with inconsistent or missing data, such as an incorrect care plan or missing discharge destination record. Finally, if a patient had multiple ED visits during the study period, we analyzed only the first one to avoid bias from multiple visits by the same person and ensure that there is no overrepresentation of their characteristics.

2.3. Data collection

Data were collected from the electronic health records through the nurse workstation (source: SAP Business Objects, the data warehouse of the Catalan Institute of Health) and the register of the Minimum Basic Data Set of emergencies. The CCIF variables and nursing care plan were collected from nursing health records. These data were recorded by the emergency nurses responsible for the patients and included assessments, diagnoses, nursing interventions, and outcomes. The discharge destinations (ED mortality, ICU admission, hospitalization, LWBS/DAMA, and home discharge) and the secondary variables were obtained from the emergency Minimum Basic Data Set. Subsequently, a database was developed in which, the data of both records were linked through the episode number.

2.4. Methods of measurement

CCIFs were collected according to the classification created in 2010 by Juvé et al. Through participatory action research involving more than 400 nurses from eight public hospitals, CCIFs were identified and classified into five domains: comorbidity/complications, developmental, psychoemotional, mental-cognitive, and sociocultural. Each domain is structured into factors and specifications.

These specifications were part of the coded and structured data in the initial and ongoing nursing assessment sections of the electronic health record, as described in the Architecture,

Terminology, Interface, Information, Nursing and Knowledge framework, which has been widely used in healthcare centers in Catalonia since 2013. Moreover, previous studies show the association of CCIFs with unfavorable outcomes; therefore, the predictive validity of this classification has already been demonstrated (11-13, 19).

2.5. Outcomes

The main outcomes of the study were ED discharge destination and 26 CCIFs. There were five destinations: (a) ED mortality: patients who died in the ED; (b) ICU admission: patients transferred to the ICU (including critical and semi-critical units); (c) hospitalization: patients admitted to the hospital (including patients transferred to other hospitals for admission); (d) LWBS/DAMA: An LWBS patient is one who leaves the ED before an electronic health record has been opened, meaning that this kind of discharge is not legally regulated (20), and DAMA occurs when a competent patient for whom an electronic health record has been opened, voluntarily leaves the ED after signing discharge paperwork. We joined these two similar discharge destinations into a composite outcome; (e) home discharge: patients who were discharged home (including patients referred from discharge to nursing homes or in-patient rehabilitation centers).

CCIFs were identified by nurses in the electronic health record and were classified into five domains. Comorbidity/complications included 13 factors: (a)uncontrolled pain (verbal numerical rating scale above three points), (b)urinary or fecal incontinence, (c) hemodynamic instability was recorded via an early warning system named VIDA, the catalan acronym for Surveillance and Identification of Acute Deterioration (categorized with a moderate or high risk of acute impairment) (19); (d)anatomical and functional disorders (amputation, limitation of movement, joint stiffness, or functional impotence), (e) transmissible infections (isolation measures), (f) high risk of hemorrhage (rectal bleeding, hematuria, hematemesis, metrorrhagia, petechiae, epistaxis, melena), (g) extreme weight (cachexia, obesity), (h) postural limitation (inability to carry out activities such as feeding, hygiene or toileting, sitting, ambulating, and maintaining balance), (i) vascular fragility (cutaneous and venous fragility, venous tortuosity, weak peripheral pulses), (j) communication disorders (aphasia, dysphasia, dysarthria, laryngectomy, tracheostomy), (k) edema, (l) involuntary movements (episodic or continuous, convulsions, tremors), and (m) dehydration (skin turgor). The developmental domain included one factor: extreme age (17-19 years old or ≥75). The psycho-emotional domain comprised three factors: (a) fear and anxiety, (b) impaired adaptation (lability, negativity, distrust of the care team), and (c) aggressiveness. The mental-cognitive domain contained four factors: (a) consciousness disorders (disorientation, confusion, drowsiness, stupor, unconsciousness), (b) agitation, (c) impaired cognitive functions (intellectual disability), and (d) perception of reality disorders (hallucinations). Finally, the sociocultural domain included five factors: (a) language limitation, (b) lack of caregiver support, (c) belief conflict (hopelessness, anguish), (d) social exclusion (indigence), and (e) illiteracy. Additionally, other secondary variables, such as age, sex, medical diagnosis, nursing care plan, and triage level were included. Data were collected retrospectively from the electronic health record.

2.6. Statistical analysis

The descriptive characteristics of the study cohort were reported as frequencies and percentages for categorical data and medians with interquartile ranges (IQRs) or mean with standard deviation (SD) for continuous data. Spider plots were used to describe the percentage of each CCIF by discharge destination. To assess the association between CCIF and discharge destination, independent multinomial logistic regression was used for each CCIF, adjusted for age, sex, and triage level. Odds ratios (ORs) and 95% confidence intervals (CIs) were reported. All analyses were performed with the statistical software package R, version 4.3.2 for Windows (http://www.R-project.org, The R Foundation).

3. Results

3.1. Baseline characteristics

Of 51,569 eligible patients, we included 35,383 patients who were treated in the ED between June 2021 and June 2022 (Figure 1). The median age of patients was 66 (IQR: 49 to 79) years and 46.4% were female. More than 80% of patients had a triage level ≥3 and the average length of stay was 10.9 hours. The most prevalent medical diagnoses were COVID-19, abdominal pain, and chest pain (Table 1). Of the total, 60.8% were home discharged directly from the ED, 34.1% were admitted to hospitalization units, 2.6% were transferred to ICU, 2.1% were LWBS/DAMA, and 0.4% died in the ED.

3.2. CCIFS

A total of 75.4% of the patients had some form of CCIF, the most prevalent being extreme age, uncontrolled pain, anxiety and fear, and consciousness disorders. The average number of care complexity factors per patient was two CCIFs, with patients who suffered ED mortality having a higher median (4 [IQR: 3 to 6]) and those who were home discharged or LWBS/DAMA having a lower median CCIF (1 [IQR: 1 to 2]) (Table 2).

Figures 2A to 2E show the distribution of the prevalence of CCIFs according to the source by discharge destination. All discharge destinations showed a high proportion of CCIFs specifically in ED mortality. Comorbidity/complications factors were more frequently registered in patients with ED mortality (92.5%) and those who required admission to the ICU (64.5%). Regarding developmental and mental-cognitive factors, patients who died in the ED (80.8% and 74.7%, respectively) and those who required hospitalization (39.2% and 17.3%, respectively) had higher prevalences of CCIFs.

Psycho-emotional and mental-cognitive factors were more frequently registered in ED mortality (19.9% and 4.1%, respectively) and LWBS/DAMA (18.9% and 2.7%, respectively).

3.3. Association between CCIFs and discharge destination

We performed a multinomial logistic regression comparing each destination with respect to home discharge. This analysis showed that the presence of a CCIF was a risk factor for ED mortality (OR: 13.49 [95%CI: 4.99;36.46]), ICU admission (OR: 1.26 [95%CI: 1.08;1.47]), and hospitalization (OR: 1.62 [95% CI: 1.53;1.71]), while it was a protective factor for LWBS/DAMA (OR: 0.64 [95%CI: 0.55;0.74)]. Figure 3 shows the results of the association of each CCIF with the discharge destination adjusted for age, sex, and triage level.
Annex 1 shows the OR of each CCIF with its 95% confidence interval estimated by multinomial logistic regression.

3.3.1. ED mortality

In relation to ED mortality, the CCIFs that showed the strongest association were dehydration, incontinence, hemodynamic instability, social exclusion, consciousness disorders, perception of reality disorders, and extreme age.

3.3.2. Need for ICU admission

Regarding the ICU admission, the CCIFs that showed the strongest association were dehydration, hemodynamic instability, consciousness disorders, and anxiety, while extreme age was a protective factor.

3.3.3. Hospitalization

In contrast, the CCIFs that showed the greatest association with hospitalization were dehydration, hemodynamic instability, perception of reality disorders, aggressiveness, and extreme age.

3.3.4. LWBS/DAMA

Finally, in relation to LWBS/DAMA, agitation, social exclusion, lack of caregiver support, and aggressiveness were the CCIFs with the strongest association, while uncontrolled pain and extreme age were protective factors.

4. Discussion

Previous studies have shown associations between CCIFs and other health outcomes, such as 30-day readmission and adverse events such as ulcers, falls or bronchoaspiration pneumonia (11, 13). Our study reveals that CCIFs are associated with different discharge destinations: ED mortality, ICU admission, hospitalization and LWBS/DAMA. These data follow the trend of previous studies (10, 20, 21).
The concept of "patient complexity" or "care complexity" has led to the development of measurement models and tools to assess this complexity to improve health care (22). An example of these models would be the Cumulative Complexity Model by Shippee et al. (23) or The Vector model of Complexity by Safford et al. (24). The last one coincides considerably with the CCIF tool, since it portrays interactions between biological, socioeconomic, cultural, environmental and behavioral forces as health determinants. However, to our knowledge, this is the first study to associate care complexity with discharge destination of a patient after visiting the ED.

4.1. Emergency department mortality

The majority of CCIFs in the comorbidity/complications category and age ≥75 years were associated with ED mortality. Although no articles have been found that address the association between care complexity and mortality in the ED, some authors address frailty as a key element related to ED mortality (6). When assessing a patient's frailty, we evaluate their physical condition to identify those most vulnerable to functional dependence (25). In this sense, the findings of our study align with others showing that mortality rates rise with increasing frailty, particularly concerning comorbidity (10, 26). In addition, although frailty is not an inevitable consequence of aging, previous studies have associated older age with an increased risk of mortality, as our results show (27). At the same time, in relation to the CCIF hemodynamic instability, other studies have revealed an association between alterations in vital signs and mortality, although the latter variable was sometimes measured 30 days after discharge and not only in the ED (28, 29).
Both the previous evidence and the current results suggest that the mental-cognitive and sociocultural spheres are important when caring for ED patients. Most mental-cognitive CCIFs were associated with ED mortality, which is consistent with previous studies that have also associated cognitive impairment with mortality (27, 28). No studies have addressed social factors specifically in EDs; however, a recently published systematic review confirmed that loneliness, social isolation, and living alone are associated with premature mortality among people with cardiovascular disease (30). Finally, in relation to the psycho-emotional domain, although previous studies have shown associations with mortality in hospitalization units (11) or other health outcomes, such as 30-day readmissions to the ED (13), in the present study, the psycho-emotional CCIFs were not associated with mortality, although they were associated with other ED discharge destinations.

4.2. Intensive care unit admission

As in mortality, many of the CCIFs were associated with ICU transfer. Previous studies have also found that some predictors of unplanned ICU admission were having comorbidities, altered vital signs, and a higher acuity classification (31-33). In terms of mental-cognitive CCIFs, consciousness disorders were a risk factor. The alteration in the level of consciousness is often related to hemodynamic instability. For this reason, it seems logical that, if there is a strong association between altered vital signs and the patient's acuity with transfer to the ICU, there is also an association between consciousness dis-

orders and transfer to the ICU.

The anxiety and fear CCIF were also associated with this discharge destination. Previous evidence on psycho-emotional factors associated with ICU transfer is scarce. However, anxiety has been associated with other unfavorable health outcomes in EDs (13). Finally, age ≥75 years was a protective factor, probably because older patients are not considered candidates for invasive measures. However, other studies have found that age is associated with ICU transfer (32, 33).

4.3. Hospitalization

Predicting the admission of patients to ED has long been a topic of interest to avoid overcrowding, which affects both patient satisfaction and patient safety. Some studies have found that factors such as advanced age, higher number of comorbidities, and altered vital signs (such as oxygen saturation or heart rate) were predictors of admission (34-36). These results are consistent with those obtained in our study, where the majority of comorbidity/complications CCIFs and age ≥75 years were associated with hospital admission. Also, consciousness disorders, agitation, and disorders of perception of reality were shown to be risk factors for hospital admission. In this context, a study carried out in the prehospital setting found that dizziness, weakness, or syncope were predictors of admission (37). Finally, all psycho-emotional CCIFs (anxiety, impaired adaption, and aggressiveness) were risk factors for hospitalization. Studies associating these factors with admission risk are scarce, meaning that our study makes an important contribution in this area.

4.4. Left without being seen and discharge against medical advice

LWBS patients are considered an indicator of quality, and DAMA patients have been associated with higher rates of readmission and poorer health outcomes compared to routine medical discharges (38), so knowing the characteristics of patients from both destinations has been a topic of interest in recent years.

Unlike the previous destinations, having any comorbidity/complications CCIF was shown to be a risk factor for this domain. In addition, age ≥75 was a protective factor. Previous studies have found that LWBS/DAMA patients were more likely to be young and had fewer procedures in the ED (21). This could explain the results obtained in our study in relation to the comorbidities/complications and developmental CCIFs.

In relation to sociocultural factors, lack of caregiver support and social exclusion were also associated with the LWBS/DAMA destination. There are few studies that have addressed these specific factors. However, the literature shows associations with other factors in the social sphere, such as ethnicity, low income, lack of health insurance, or substance abuse (38-41). Patients who presented any of the psycho-emotional CCIFs were more at risk of LWBS/DAMA, which indicates that this area is especially relevant in this type of discharge destination. Likewise, this domain has been associated with readmissions to the ED within 30 days in previous studies (13).

5. Limitations

This study has some limitations. First, our results cannot be generalized to other hospitals or other wards, because this was a single-center study in an ED. Another limitation related to data recording is that, being based on retrospective data, the study is subject to misclassification of predictors and outcomes if inaccuracies were present in the electronic health records. However, ED nurses, who are responsible for doing most of the recording of patient health data, have extensive experience and training with the software used to complement electronic health record. Also, the high number of patients included likely reduces the impact of this limitation. Finally, although the multivariate analysis included potential confounders such as age, sex, and triage level, there are likely additional confounders that may have influenced the association between CCIFs and discharge destination, such as work environment, patient acuity or other clinical outcomes such as chronic disease or Charlson comorbidity index. Therefore, future prospective studies should include these variables.

6. Conclusions

The present study demonstrates the importance of considering the care complexity factors in EDs. Its measurement involves the assessment of patient complexity in all its spheres, which allows useful information to be obtained both at the clinical and managerial level. The different discharge destinations from the ED showed strong associations with the patient's complexity factors. Therefore, health professionals should consider these relationships for the design of early detection strategies and as an aid in decision-making, to ensure equity and quality of care.

7. Declarations

7.1. Acknowledgments

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7.2. Funding

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7.3. Author contribution

All authors passed the four criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

7.4. Conflict of interest

The authors declare they have no conflict of interest.

7.5. Using artificial intelligence chatbots

No AI chatbots were used for any part of this study.

7.6. Availability of data

All relevant data are available in the article or the Supplementary Materials.

7.7. Ethical considerations

The study was approved by the institutional review board of Bellvitge University Hospital on April 26, 2022 (Ref. PR051/22).

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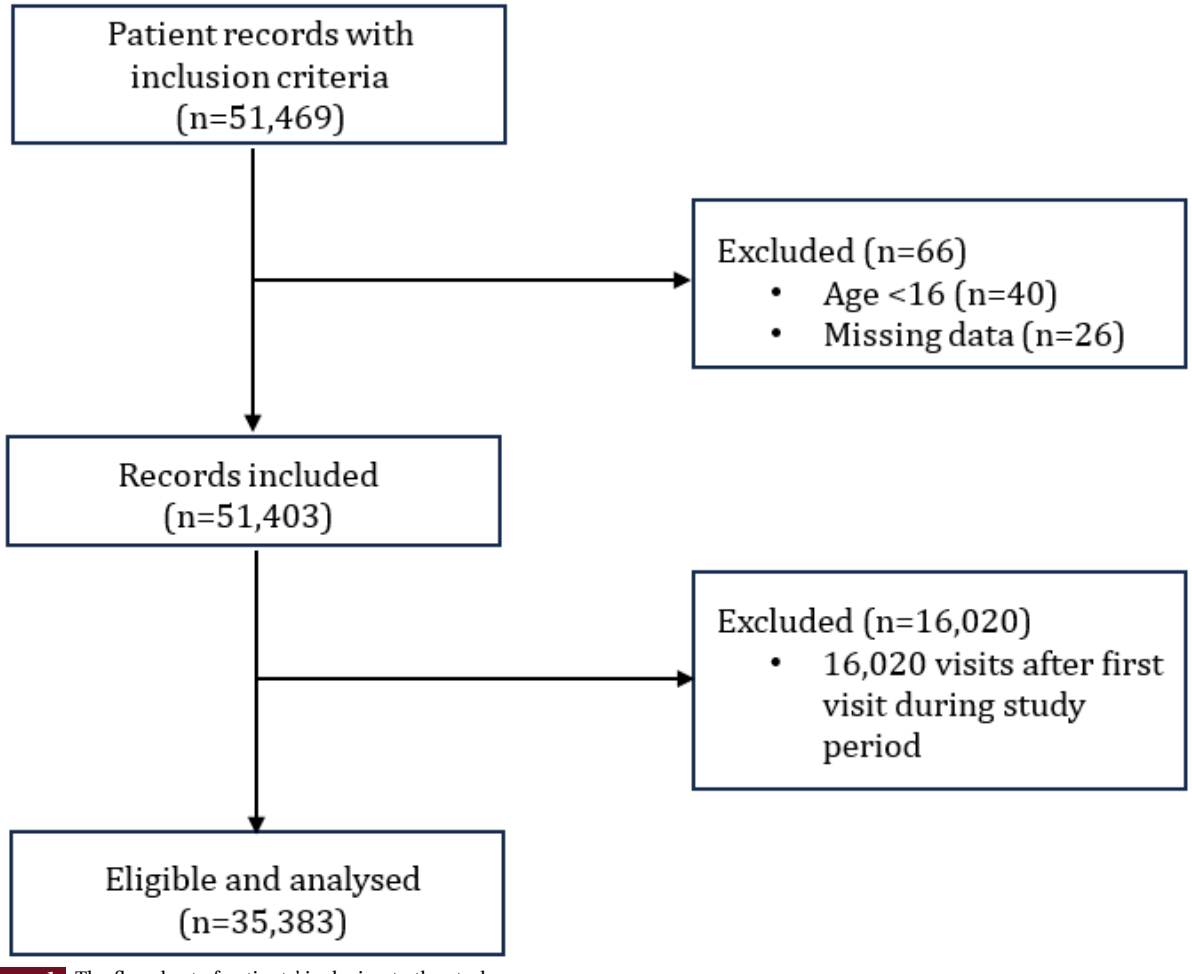

Figure 1: The flowchart of patients' inclusion to the study.

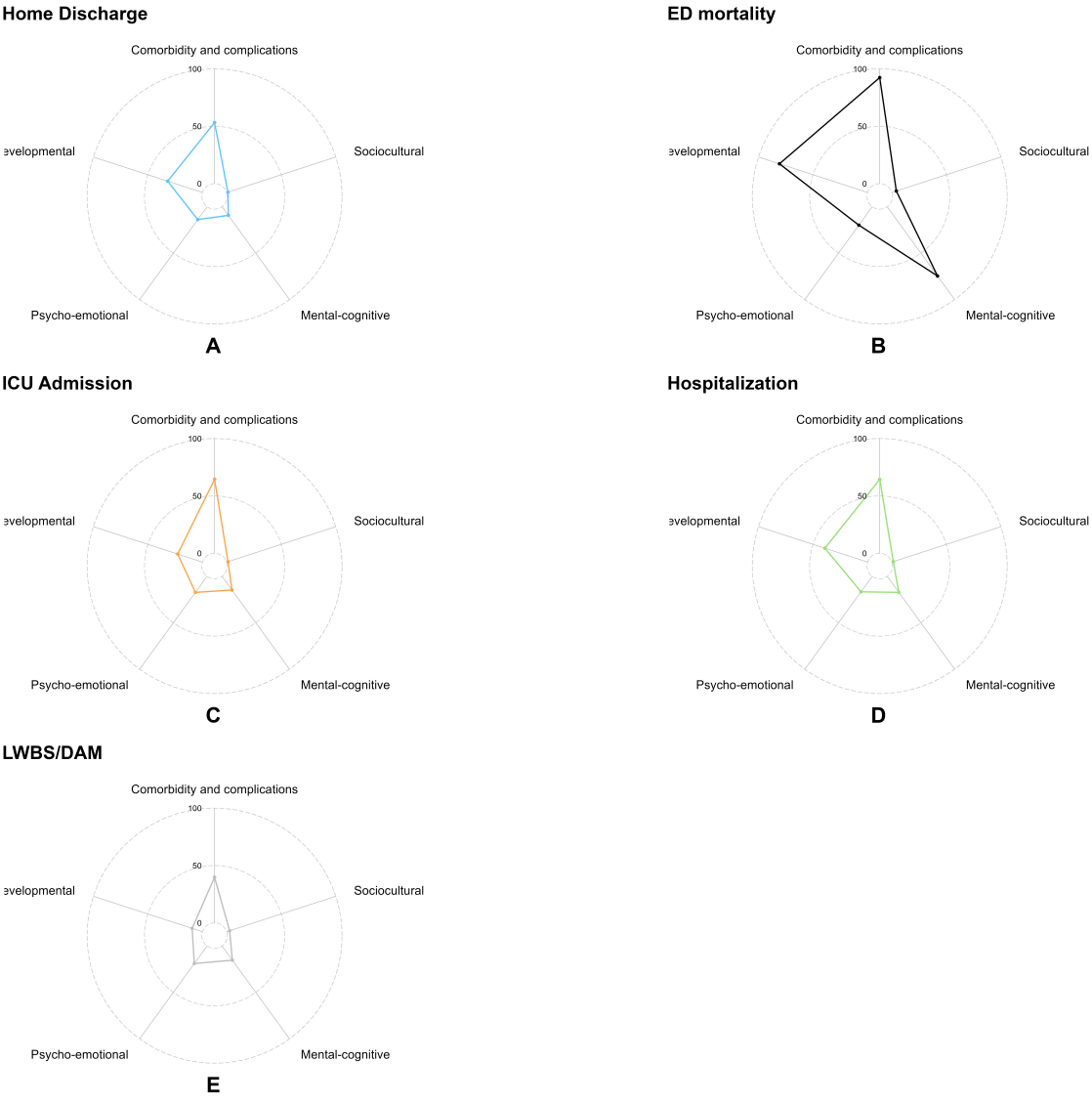

Figure 2: Distribution of the different sources of complexity according to the registration destinations. ED: emergency department; ICU: Intensive care unit; LWBS: left without being seen; DAMA: discharge against medical advice.

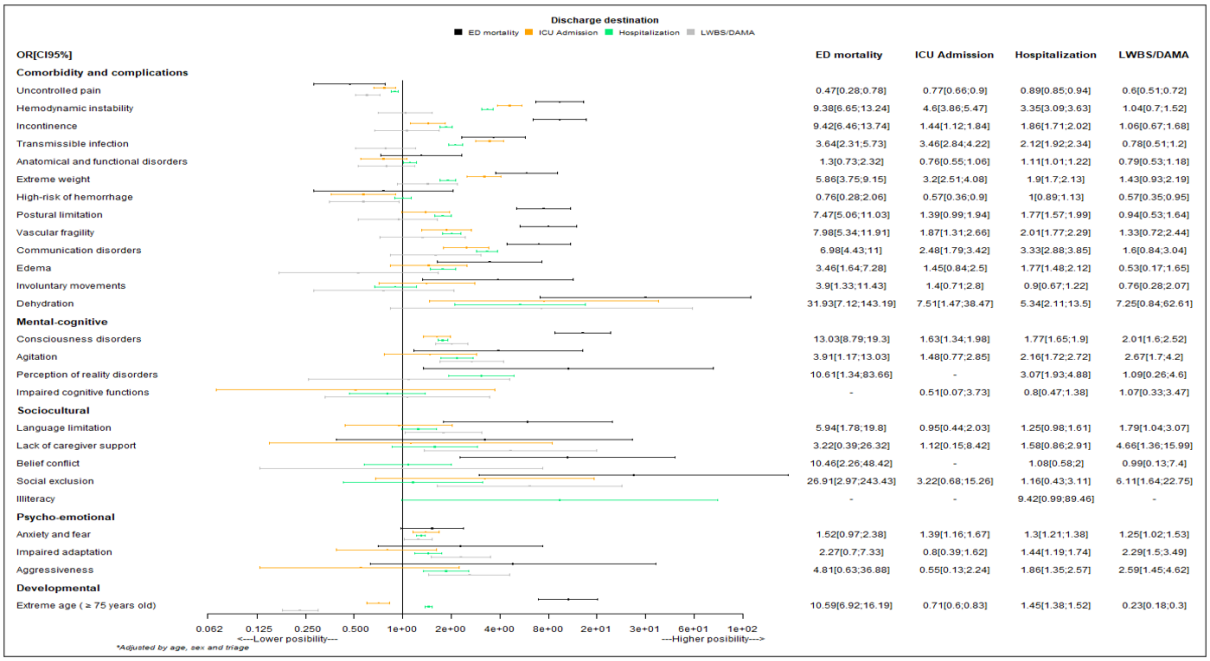

Figure 3: Multivariate multinomial logistic regression analysis. Estimated value of the Odds Ratio (OR) for each complexity factor. CI: confidence interval; ED: emergency department; ICU: Intensive care unit; LWBS: left without being seen; DAMA: discharge against medical advice.

Table 1: Clinical and demographic characteristics of the study population (n = 35383)

Characteristics	Values
Age (years)	
Mean ± SD	63.0 ± 19.8
Median [Q1; Q3]	66.1 [49.0;79.0]
Sex	
Male	18973 (53.6)
Female	16410 (46.4)
Triage level	
1	1041 (2.97)
2	9469 (27.0)
3	19014 (54.3)
4	4104 (11.7)
5	1382 (3.95)
Length of stay (hours)	
Median [Q1; Q3]	10.9 [6.78;19.5]
Medical diagnoses	
COVID-19	1780 (5.03)
Abdominal pain	751 (2.12)
Chest pain	687 (1.94)
Syncope and collapse	645 (1.82)
Cerebral infarction	602 (1.70)
Others	29352 (83.0)
Nursing Care Plan	
Consult for dyspnea	2698 (7.63)
Coronavirus infection (COVID-19)	2444 (6.91)
General malaise / Constitutional syndrome	2322 (6.56)
Consultation for chest pain	2216 (6.26)
Abdominal pain	2215 (6.26)
Polycontusions	1539 (4.35)
Others	17840 (50.4)

Data are presented as mean ± standard deviation (SD), frequency (%), or median [interquartile range (IQR)].

Table 2: Distribution of care complexity individual factors (CCIFs) in different destinations at discharge (n = 35383)

CCIFs	Total	ED mortality N=146	ICU Admission N=915	Hospitalization N=12,056	LWBS/DAMA N=751	Home Discharge N=21,515
Patients with a CCIF						
Number (%)	26,671 (75.4)	142 (0.53)	703 (2.64)	9,766 (36.6)	470 (1.76)	15,590 (58.5)
Total CCIFs per patient						
Median [IQR]	2.00 [1.00;2.00]	4.00 [3.00;6.00]	2.00 [1.00;3.00]	2.00 [1.00;3.00]	1.00 [1.00;2.00]	1.00 [1.00;2.00]
Comorbidity and complications						
Uncontrolled pain	11,360 (32.1)	18 (12.3)	230 (25.1)	3,555 (29.5)	190 (25.3)	7,367 (34.2)
Hemodynamic instability	3,367 (9.52)	67 (45.9)	196 (21.4)	2,024 (16.8)	29 (3.86)	1,051 (4.88)
Incontinence	3,053 (8.63)	90 (61.6)	81 (8.85)	1,560 (12.9)	21 (2.80)	1,301 (6.05)
Transmissible infection	2,049 (5.79)	24 (16.4)	138 (15.1)	1,051 (8.72)	24 (3.20)	812 (3.77)
Anatomical and functional disorders	2,030 (5.74)	15 (10.3)	41 (4.48)	773 (6.41)	27 (3.60)	1174 (5.46)
Extreme weight	1,520 (4.30)	27 (18.5)	85 (9.29)	727 (6.03)	23 (3.06)	658 (3.06)
High risk of hemorrhage	1,388 (3.92)	5 (3.42)	19 (2.08)	485 (4.02)	16 (2.13)	863 (4.01)
Postural limitation	1,333 (3.77)	43 (29.5)	44 (4.81)	658 (5.46)	14 (1.86)	574 (2.67)
Vascular fragility	1,152 (3.26)	41 (28.1)	36 (3.93)	600 (4.98)	11 (1.46)	464 (2.16)
Communication disorders	1,070 (3.02)	30 (20.5)	49 (5.36)	705 (5.85)	10 (1.33)	276 (1.28)
Edema	543 (1.53)	8 (5.48)	15 (1.64)	266 (2.21)	3 (0.40)	251 (1.17)
Involuntary movements	216 (0.61)	4 (2.74)	9 (0.98)	68 (0.56)	4 (0.53)	131 (0.61)
Dehydration	33 (0.09)	3 (2.05)	2 (0.22)	21 (0.17)	1 (0.13)	6 (0.03)
Total	20,244 (57.2)	135 (92.5)	590 (64.5)	7,765 (64.4)	299 (39.8)	11,455 (53.2)
Developmental						
Extreme age (≥75 years old)	11,988 (33.9)	118 (80.8)	208 (22.7)	4,723 (39.2)	71 (9.45)	6,868 (31.9)
Psycho-emotional						
Anxiety and fear	4,951 (14.0)	25 (17.1)	154 (16.8)	1,875 (15.6)	124 (16.5)	2,773 (12.9)
Impaired adaptation	513 (1.45)	4 (2.74)	9 (0.98)	194 (1.61)	25 (3.33)	281 (1.31)
Aggressiveness	175 (0.49)	1 (0.68)	2 (0.22)	70 (0.58)	14 (1.86)	88 (0.41)
Total	5,318 (15.0)	29 (19.9)	158 (17.3)	2,010 (16.7)	142 (18.9)	2,979 (13.8)
Mental-cognitive						
Consciousness disorders	4,198 (11.9)	107 (73.3)	132 (14.4)	1994 (16.5)	95 (12.6)	1870 (8.69)
Agitation	353 (1.00)	3 (2.05)	10 (1.09)	159 (1.32)	23 (3.06)	158 (0.73)
Perception of reality disorders	80 (0.23)	1 (0.68)	0 (0.00)	44 (0.36)	2 (0.27)	33 (0.15)
Impaired cognitive functions	76 (0.21)	0 (0.00)	1 (0.11)	18 (0.15)	3 (0.40)	54 (0.25)
Total	4,442 (12.6)	109 (74.7)	135 (14.8)	2081 (17.3)	115 (15.3)	2,002 (9.31)
Sociocultural						
Language limitation	317 (0.90)	3 (2.05)	7 (0.77)	111 (0.92)	16 (2.13)	180 (0.84)
Lack of caregiver support	51 (0.14)	1 (0.68)	1 (0.11)	21 (0.17)	4 (0.53)	24 (0.11)
Belief conflict	51 (0.14)	2 (1.37)	1 (0.11)	17 (0.14)	1 (0.13)	30 (0.14)
Social exclusion	23 (0.07)	1 (0.68)	2 (0.22)	7 (0.06)	3 (0.40)	10 (0.05)
Illiteracy	5 (0.01)	0 (0.00)	0 (0.00)	4 (0.03)	0 (0.00)	1 (0.00)
Total	430 (1.22)	6 (4.11)	11 (1.20)	156 (1.29)	20 (2.66)	237 (1.10)

Data are presented as frequency (%) or median [interquartile range (IQR)]. ED: emergency department; ICU: Intensive care unit; LWBS: left without being seen; DAMA: discharge against medical advice.

Annex 1: Multinomial logistic regression analysis of the association of discharge destinations with care complexity individual factor (CCIF)

CCIF	ED mortality	ICU Admission	Hospitalization	LWBS/DAMA
Comorbidity and complications				
Uncontrolled pain	0.47 (0.28;0.78)	0.77 (0.66;0.9)	0.89 (0.85;0.94)	0.6 (0.51;0.72)
Hemodynamic instability	9.38 (6.65;13.24)	4.6 (3.86;5.47)	3.35 (3.09;3.63)	1.04 (0.7;1.52)
Incontinence	9.42 (6.46;13.74)	1.44 (1.12;1.84)	1.86 (1.71;2.02)	1.06 (0.67;1.68)
Transmissible infection	3.64 (2.31;5.73)	3.46 (2.84;4.22)	2.12 (1.92;2.34)	0.78 (0.51;1.2)
Anatomical and functional disorders	1.3 (0.73;2.32)	0.76 (0.55;1.06)	1.11 (1.01;1.22)	0.79 (0.53;1.18)
Extreme weight	5.86 (3.75;9.15)	3.2 (2.51;4.08)	1.9 (1.7;2.13)	1.43 (0.93;2.19)
High risk of hemorrhage	0.76 (0.28;2.06)	0.57 (0.36;0.9)	1 (0.89;1.13)	0.57 (0.35;0.95)
Postural limitation	7.47 (5.06;11.03)	1.39 (0.99;1.94)	1.77 (1.57;1.99)	0.94 (0.53;1.64)
Vascular fragility	7.98 (5.34;11.91)	1.87 (1.31;2.66)	2.01 (1.77;2.29)	1.33 (0.72;2.44)
Communication disorders	6.98 (4.43;11)	2.48 (1.79;3.42)	3.33 (2.88;3.85)	1.6 (0.84;3.04)
Edema	3.46 (1.64;7.28)	1.45 (0.84;2.5)	1.77 (1.48;2.12)	0.53 (0.17;1.65)
Involuntary movements	3.9 (1.33;11.43)	1.4 (0.71;2.8)	0.9 (0.67;1.22)	0.76 (0.28;2.07)
Dehydration	31.93 (7.12;143.19)	7.51 (1.47;38.47)	5.34 (2.11;13.5)	7.25 (0.84;62.61)
Mental-cognitive				
Consciousness disorders	13.03 (8.79;19.3)	1.63 (1.34;1.98)	1.77 (1.65;1.9)	2.01 (1.6;2.52)
Agitation	3.91 (1.17;13.03)	1.48 (0.77;2.85)	2.16 (1.72;2.72)	2.67 (1.7;4.2)
Perception of reality disorders	10.61 (1.34;83.66)	-	3.07 (1.93;4.88)	1.09 (0.26;4.6)
Impaired cognitive functions	-	0.51 (0.07;3.73)	0.8 (0.47;1.38)	1.07 (0.33;3.47)
Sociocultural				
Language limitation	5.94 (1.78;19.8)	0.95 (0.44;2.03)	1.25 (0.98;1.61)	1.79 (1.04;3.07)
Lack of caregiver support	3.22 (0.39;26.32)	1.12 (0.15;8.42)	1.58 (0.86;2.91)	4.66 (1.36;15.99)
Belief conflict	10.46 (2.26;48.42)	-	1.08 (0.58;2)	0.99 (0.13;7.4)
Social exclusion	26.91 (2.97;243.43)	3.22 (0.68;15.26)	1.16 (0.43;3.11)	6.11 (1.64;22.75)
Illiteracy	-	-	9.42 (0.99;89.46)	-
Psycho-emotional				
Anxiety and fear	1.52 (0.97;2.38)	1.39 (1.16;1.67)	1.3 (1.21;1.38)	1.25 (1.02;1.53)
Impaired adaptation	2.27 (0.7;7.33)	0.8 (0.39;1.62)	1.44 (1.19;1.74)	2.29 (1.5;3.49)
Aggressiveness	4.81 (0.63;36.88)	0.55 (0.13;2.24)	1.86 (1.35;2.57)	2.59 (1.45;4.62)
Developmental				
Extreme age (75 years old)	10.59 (6.92;16.19)	0.71 (0.6;0.83)	1.45 (1.38;1.52)	0.23 (0.18;0.3)

Home discharge was considered as reference for all analysis. Data are presented as Odds ratio with 95% confidence interval.
ED: emergency department; ICU: Intensive care unit; LWBS: left without being seen; DAMA: discharge against medical advice;
"-": Not Calculable.