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When to discharge and when to voluntary or compulsory hospitalize? Factors associated with treatment decision after self-harm

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ABSTRACT

Clinicians assessing suicidal patients in emergency departments (EDs) must decide whether to admit the person to a psychiatric ward with voluntary or compulsory hospitalization or to discharge him/her as an outpatient. This cross-sectional study aimed to identify independent predictors of this decision among a large sample of self-harm (SH) patients. It used data from all patients admitted to four Swiss EDs between 2016 and 2019. Socio-demographic, clinical, and suicidal process-related characteristics data were evaluated against the decision for voluntary or compulsory hospitalization using t-tests, Chi-Square tests and logistic multiple regression. 2142 episodes from 1832 unique patients were evaluated. Independent predictors of decision to hospitalize included: male gender, advanced age, hospital location, depression and personality disorders, substance use, a difficult socio-economic condition, a clear intent to die, and a serious suicide attempt. Significant variables that emerged as independent predictors of compulsory hospitalization were hospital location, not having anxiety and personality disorders, being retired, having a clear intent to die, and making a serious suicide attempt. Hospital EDs had different rates of compulsory psychiatric admission. However, the decision to admit a patient for hospitalization, either voluntary or compulsory, was mainly based on clinical factors.

1. Introduction

Suicide is among the top 20 causes of death worldwide. According to the World Health Organisation, nearly one million people die from suicide every year (World Health Organization 2014). Assessing and treating suicidal thoughts and behavior (STB) in emergency departments (EDs) is of utmost importance, since (i) the ED is often the patient's first point of contact with mental health services and influence the link to subsequent mental health services consultations (Larkin and Beautrais, 2010); (ii) the large majority of people with STB needs medical care (Van Heeringen et al., 1995, Da Cruz et al., 2011); and (iii) suicide attempt (SA) and self-harm[2] (SH) (Hawton et al., 2003, World

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[2] For this study, self-harm is defined as "all non-fatal intentional acts of self-poisoning or self-injury, irrespective of degree of suicidal intent or other types of motivation" ((Hawton et al., 2003) Thus, including both DSM 5 non-suicidal self-injury and other acts of self-harm with various suicidal intents, following a dimensional rather than categorical approach to the phenomenon (Hawton et al., 2003). Of note is the fact that the study was conducted before the recent inclusion of Suicidal Behavior and Nonsuicidal Self-injury in DSM-5-TR, as diagnostic codes after their inclusion in DSM-5 as "conditions for further study".

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Health Organization 2016) are the strongest predictors of further episodes of SA, SH, and completed suicide (Geulayov et al., 2016, Suominen et al., 2004, Owens et al., 2002, Suokas et al., 2001, Christiansen and Frank Jensen, 2007).

Among other decisions, clinicians assessing suicidal patients in EDs have to decide whether to admit the person to a psychiatric ward with (voluntary hospitalization) or without (compulsory hospitalization) him/her consent. Legislation on this topic greatly vary between countries. In Switzerland where this study took place, the Civil Code allows a compulsory hospitalisation as a measure of deprivation of liberty for assistance purposes with the following article: *A person suffering from a mental disorder or mental disability or serious neglect (the patient) may be committed to an appropriate institution if the required treatment or care cannot be provided otherwise. The burden that the person concerned represents for his relatives and for third parties as well as their protection are taken into consideration.*[3] The decision for a voluntary or a compulsory hospitalisation is critical since outpatient and inpatient treatments are very different. While hospitalisation offers the highest intensity of care and may thus be considered as protective against further STB as shown by some health-services research (Bastiampillai et al., 2016, Kapur et al., 2016), it may also favour a regressive process and other authors question its usefulness in preventing suicide (Large and Ryan, 2014). Furthermore, although compulsory admissions are frequently decided when a highly suicidal patient does not accept the hospitalisation, it may increase the risk of further SA (Jordan and McNiel, 2020) and is associated with stigma and other negative outcomes. Compulsory admissions may induce fright and distress in patients (Akther et al., 2019), contribute to post-traumatic stress disorder (Mueser et al., 2010), alter patients' confidence in care (Khatib et al., 2018) and reduce their satisfaction with treatment (Strauss et al., 2013). These phenomena may also influence future decisions to seek care. Finally, the type of mental health services and the resources available (e.g. psychiatric beds, outpatient crisis team but also new treatment options such as esketamine nasal spray for acute suicidal ideation (Canuso et al., 2021)) as well as economic factors (e.g. fear of improper costly hospitalizations) also influence decisions to discharge or hospitalize.

Available guidelines and textbooks (Association, 2003, Ryan et al., 2015, World Health Organization 2019, Sadek, 2018, Health NSWDo 2004, Perlman et al., 2011) suggest different approaches that should be followed when making a choice on this complex clinical issue. Among other criteria, severity of SA and intent to die, acute mental illness, precautions to avoid being rescued, and severe and acute symptoms (e.g., anxiety, agitation) may favour hospitalisation whereas a good therapeutic alliance and adequate psychosocial support are arguments for outpatient treatment. However, the question of clinical indications for compulsory admission is only barely addressed. A recent systematic review of clinical and social factors associated with compulsory psychiatric hospitalisations highlighted that risk to self was widely reported (Walker et al., 2019), but no clear association between risk to self and compulsory admission was identified. Moreover, whether the assessment of risk was based on previous STB, or expressions of suicidal ideation, was often unclear.

Several studies aimed to identify predictors of hospitalization after SA. These included sociodemographic characteristics such as male gender (Miret et al., 2011) or older age (Suominen and Lönnqvist, 2006); clinical and suicide-related factors such as the severity of the SA (Baca-García et al., 2004) and intent to die (Miret et al., 2011), the choice of more lethal methods (Miret et al., 2011); past history of SA (Baca-García et al., 2004) or psychiatric hospitalisation (Miret et al., 2011, Hepp et al., 2004); the presence and severity of an acute mental illness (e.g., mania, psychotic episode, mood disorder) (Miret et al., 2011, Hepp et al., 2004); and system-related factors such as differences between sites (Miret et al., 2011, Suominen and Lönnqvist, 2006, Kapur et al., 1998). However, as observed in the guidelines, we found no study examining the predictors of compulsory admission after SH or SA.

This study thus aimed to identify independent predictors of the decision of (i) psychiatric hospitalization (versus discharge) and (ii) compulsory psychiatric hospitalizations (versus voluntary admission or discharge) among a large a sample of people with SH admitted to EDs of French-speaking Switzerland.

2. Methods

2.1. The French-speaking Swiss program for monitoring SH

Data for this study was obtained from the French-speaking Swiss program for monitoring SH, full details are described elsewhere (Ostertag et al., 2019). In brief, this monitoring allowed data collection during the psychiatric assessment of patients admitted for SH in four EDs of general hospitals between December 2016 and November 2019. The participating EDs are located in four regions or cities in French-speaking Switzerland whose catchment areas represent the following populations: Lausanne (230,000), Geneva (450,000), Valais (130,000), and Neuchâtel (145,000).

2.2. Participants

All episodes of SH of patients 18 years of age and older were included in the study. Episodes rather than patients were included. Although this choice implied an overrepresentation of people with repeated episodes, we considered the fact that clinical and suicidal-related data as well as systemic information – which were of interest for our research question – may vary between episodes.

2.3. Procedure

Data were recorded by the psychiatric resident assessing the patient in the ED by completing entries on a paper form. Socio-demographic characteristics (e.g., age, gender, nationality, problematic socioeconomic situation, migration in the past 10 years, civil status), clinical information (e.g., first ICD-10 diagnosis coded by sections, past history of SH, psychiatric history, existing follow-up), and detailed information on the patient's suicidal process (e.g., suicidal intent, method of SH, severity of the SH episode, protective and precipitating factors) were recorded. Data on treatment decision (e.g., outpatient follow-up, voluntary hospitalisation, compulsory hospitalisation) were also logged.

Name, surname, gender, and birth date were merged into one string and subjected to the Message Digest 5 (MD5) algorithm, which creates a 128-bit cryptographic hash. This unique text string allowed us to ensure patient anonymity in the database while allowing us to identify participants with multiple episodes within one site or between different sites.

2.4. Statistical analysis

We conducted two separate analyses. One compared episodes followed by hospitalisation ($n = 1083$) and episodes with outpatient follow-up ($n = 1059$), and the other compared episodes followed by compulsory hospitalisation ($n = 357$) with all other episodes (outpatient follow-up or voluntary hospitalisation $n = 1785$).

Comparisons between groups were performed with independent *t*-tests for continuous variables and Pearson's Chi-Square tests (or Fisher Exact tests with exact or Monte-Carlo estimation when needed) for categorical variables. In order to highlight the most important variables independently of each other, a multiple logistic model was estimated: potential confounding factors were assessed independently in a series of simple models and significant factors were then simultaneously introduced in a multiple model to control for these confounding influence. Multiple imputation was deemed not feasible given the very large

[3] Swiss Civil Code of 10 December 1907 (Status as of 1st January 2022); CC; RS 210; art. 426

proportion of nominal variables. Only variables with less than 15% of missing data and reaching a $p < 0.05$ level of significance when comparing the two groups were included as independent variables. All statistical analyses were performed with IBM-SPSS 27. All statistical tests were two-tailed and significance was determined at the 0.05 level.

3. Results

3.1. Hospitalisation versus non-hospitalisation

2142 episodes from 1832 unique patients were included in the analysis. 89% (1630) of patients had one episode. Table 1 shows the comparison between episodes followed by outpatient follow-up versus hospitalisation. Hospitalisation rates differed significantly ($p < 0.001$) between EDs, ranging from 45.1% (Valais) to 62.1% (Neuchâtel). Women were overrepresented in the overall sample and were significantly more often directed to an outpatient follow-up (61.8%) compared to men (38.1%) ($p < 0.001$) and hospitalised patients were significantly older (mean=40.53 years old) than those offered an outpatient follow-up (mean=35.98 years old) ($p < 0.001$). People with a primary diagnosis of depression, dementia, schizophrenia, or mania were more often admitted to a psychiatric ward than those with anxiety disorder, personality disorder, or substance use ($p < 0.001$). Other sociodemographic variables associated with hospitalisation were problematic socio-economic status, living alone, without kids, in a psychiatric institution, unwanted migration, or absence of migration compared to chosen migration, level of education, unemployment, or retired from work. Several clinical and suicide-related characteristics were also associated with hospitalisation: physical pain; more lethal suicide method (e.g., jumping from a height, firearm, drowning); clear intent to die; serious SA (defined by the fact that it required hospitalisation for more than 24 h and met one of the following criteria: management in a specialised unit (e.g., intensive care), surgery under anaesthesia, or prescription of major medications) (Beautrais, 2001, 2003, Gvion and Levi-Belz, 2018). Finally, professional mobbing and professional breakdown were determined to be precipitating factors since they were more frequent in the hospitalisation group.

In the multiple logistic model, several variables emerged as independent predictors of hospitalisation: being a man (OR=1.561, $p = 0.006$), advanced age (OR=1.029, $p == 0.001$), being assessed in Neuchatel in comparison with Lausanne (OR=3.261, $p < 0.001$), suffering from depression as compared to anxiety disorder (OR=0.308, $p < 0.001$), personality disorder (OR=0.618, $p == 0.018$), substance use (OR=0.300, $p == 0.001$), having a difficult versus good socioeconomic condition (OR=0.656, $p == 0.013$), a clear versus unclear (OR=0.258, $p < 0.001$) or no (OR=0.078, $p < 0.001$) intent to die, or a serious SA (OR=1.640, $p == 0.014$).

3.2. Compulsory hospitalisation versus non-hospitalisation or voluntary hospitalisation

Table 2 shows the comparison between episodes followed by other measures compared to patients with compulsory hospitalisation.

The rate of compulsory hospitalisation differed significantly ($p < 0.001$) between emergency services, ranging from 8.4% (Valais) to 22.3% (Neuchâtel). No significant gender differences were observed. Diagnostic classifications differed significantly ($p < 0.001$): people with a primary diagnosis of depression, schizophrenia, or mania were more often admitted to a psychiatric ward by compulsory hospitalisation compared to those with anxiety disorder, personality disorder, or substance use. Patients with involuntary hospitalisation were about two years older ($p == 0.045$). Other socio-demographic variables associated with compulsory hospitalisation were problematic socioeconomic status ($p == 0.006$) and professional activity ($p == 0.011$): the proportion of retired patients was about two-fold higher in the involuntary hospitalisation group. Several clinical and suicide-related characteristics were also associated with hospitalisation: method of self-harm ($p == 0.001$) with more lethal suicide method (e.g., jumping from a height, hanging or firearm); location at the time of the episode ($p == 0.021$) with more episodes in public places in the involuntary hospitalisation group, i.e., a clear intent to die ($p < 0.001$); serious SA ($p < 0.001$); interrupted versus aborted SH ($p == 0.014$), and arrival at the ED ($p < 0.001$) (more arrival with ambulance or police for the involuntary hospitalisation group). Alcohol use in the last three months ($p == 0.032$) was also more frequent in the involuntary hospitalisation group. Pre-SH follow-up ($p < 0.001$) was significantly different: patients who were hospitalised involuntarily were more frequently outpatients in the public psychiatric network or had a past voluntary or involuntary psychiatric hospitalisation. Finally, a past episode of hetero-aggression ($p == 0.025$) and a recent love break-up ($p == 0.039$) were also more frequent in the compulsory hospitalisation group.

In the multiple logistic model, several variables emerged as independent predictors of not being compulsory hospitalised. Being assessed in Valais as compared to Lausanne (OR=0.395, $p < 0.001$), being assessed in Geneva as compared to Lausanne (OR = 0.427, $p = 0.010$), a diagnosis of anxiety disorder (OR=0.499, $p == 0.003$) or personality disorder as compared to depression (OR=0.591, $p == 0.025$), being retired as compared to being unemployed (OR=4.277, $p == 0.002$), an unclear intent to die (OR=0.504, $p == 0.001$) or no intent to die (OR=0.226, $p < 0.001$), and a non-serious SH (OR=1.955, $p < 0.001$).

4. Discussion

Using a large database of SH episodes, we sought to identify predictive factors for (i) the decision of psychiatric hospitalisation (versus outpatient treatment) and (ii) its compulsory nature (versus voluntary admission or outpatient treatment).

4.1. Predictors of hospitalisation

Key findings are the significant differences between the four studied emergency services regarding our two aims. Hospitalisation rates ranged from 45.1% (Valais) to 62.1% (Neuchâtel); previous studies in other Swiss settings found similar rates (Hepp et al., 2004), while other studies in Spanish (Miret et al., 2011) or Finnish (Suominen and Lönnqvist, 2006) hospitals were lower. This highlights the importance of context in terms of hospital setting to explain the decision to hospitalise since this weighs in on the availability of outpatient care and density of psychiatric beds (for example, it is lower in Spain and Finland than in Switzerland (Eurostat 2222)). This important result echoes the large difference we also found in rates of compulsory hospitalization; since similar factors may probably explain these two results, they are further discussed together below (see second paragraph of Section 4.2).

Regarding demographic characteristics, we found that men were significantly and independently more often admitted to a psychiatric ward than women were. Gender issues are a much debated topic in suicide prevention (Barrigon and Cegla-Schvartzman, 2020); it is well established that men die more by suicide and use more lethal methods, while women more frequently attempt suicide, thus making the higher rate of hospitalisation quite logical. The fact that this relationship remains significant in the multiple logistic regression analysis (thus independently of the method and the severity of SH), like in two other studies (Miret et al., 2011, Hepp et al., 2004) but not in others (Suominen and Lönnqvist, 2006, Baca-García et al., 2004, Schnyder et al., 1999), is of note. This demonstrates that, as in other fields of medicine (Michaud et al., 2021), gender bias likely influences clinicians and leads them to favour hospitalisation for men and outpatient follow-up for women.

Age also played a role in the decision to hospitalise, as the probability of being admitted in a psychiatric hospital increased with age, a result also found by Suominen and Lönnqvist (2006) but not by other studies (Schnyder et al., 1999, Van Veen et al., 2019). It may be that

Table 1
Comparison between patients for post-suicide attempt follow-up by hospitalization or non-hospitalization. ($N = 2142$).

	Patients with NON-Hospitalization$N = 1059$	Patients with Hospitalization$N = 1083$	Statistics	*P*-value
Sites, % (N)			$\chi^2(4) = 33.249$	<.001
Lausanne	50.7 (576)	49.3 (560)		
Geneva	51.6 (112)	48.4 (105)		
Geneva Malatavie	78.9 (15)	21.1 (4)		
Neuchatel	37.9 (148)	62.1 (243)		
Valais	54.9 (208)	45.1 (171)		
Gender, % (N)			Fisher's exact test	<.001
Male	38.1 (404)	45.9 (497)		
Female	61.8 (654)	53.8 (583)		
Other	0.1 (1)	0.3 (3)		
Diagnostic, % (N)			$\chi^2(8) = 131.700$	<.001
Dementia F0	0.4 (4)	0.7 (7)		
Alcohol use F10	6.1 (60)	3.7 (38)		
Substance use F11-F19	2.7 (27)	2.2 (23)		
Schizophrenia F2	4.9 (48)	9.5 (98)		
Mania F3-M	1.7 (17)	2.7 (28)		
Depression F3-D	21.7 (214)	40.3 (416)		
Anxiety F4	31.9 (314)	18 (186)		
Behavioral syndromes assoc. w. physiological disturbances F7-F9	3.0 (30)	1.5 (16)		
Personality disorder F6	27.5 (271)	21.4 (221)		
Age, Mean (SD)	35.98 (13.469)	40.53 (15.681)	t(2103.632) = -7.125	<.001
Legal status, % (N)			Fisher's exact test	.171
Swiss nationality	70.3 (566)	71.3 (593)		
Legally transiting in Switzerland	1.1 (9)	1.2 (10)		
Permit B	6.8 (55)	5.3 (44)		
Permit C	9.8 (79)	10.2 (85)		
Permit F	1.9 (15)	0.8 (7)		
Permit L	0.5 (4)	0.7 (6)		
Permit N	1.4 (11)	1.9 (16)		
NEM Status	1.5 (12)	2.3 (19)		
Clandestine	4.5 (36)	3.2 (27)		
Non-accompanied minor	0.4 (3)	0.0 (0)		
Other	1.9 (15)	3.0 (25)		
Migration, % (N)			$\chi^2(2) = 8.370$	.015
no migration	72.6 (615)	76 (658)	$\chi^2(1) = 16.097$	<.001
selected migration	20.9 (177)	15.8 (137)		
forced migration	6.5 (55)	8.2 (71)		
Socioeconomic situation, % (N)	44.7 (414)	35.5 (318)		
Non-problematic	55.3 (512)	64.5 (578)		
Problematic				
Lifestyle, % (N)			$\chi^2(8) = 44.794$	<.001
By him/herself	23.5 (248)	28.7 (306)		
Couple without children	16.9 (178)	13.9 (148)		
Couple with children	21.4 (226)	21.6 (231)		
By his or her parents	15.2 (160)	11.0 (118)		
Shared accommodation	4.1 (43)	3.8 (41)		
Foster care, institution for the elderly, etc.	5.8 (61)	10.2 (109)		
Incarcerated	8.6 (91)	4.7 (50)		
Homeless	1.5 (16)	2.7 (29)		
Other	2.9 (31)	3.4 (36)		
Civil status, % (N)			$\chi^2(4) = 9.391$	.052
Single	55.2 (561)	50.5 (524)	$\chi^2(1) = 6.074$	.014
Married or registered partnership	22.8 (232)	24.5 (254)		
Divorced	13.5 (137)	15.1 (157)		
Separated	6.7 (68)	6.5 (67)		
Widowed	1.8 (18)	3.5 (36)		
Children, % (N)	44.2 (446)	49.7 (954)		
Yes	55.8 (562)	50.3 (514)		
No				
Level of education, % (N)			$\chi^2(9) = 20.614$	.014
Compulsory schooling	15.7 (166)	11.9 (129)		
Apprenticeship	15.5 (164)	17.5 (189)		
Maturity diploma	4.8 (51)	3.1 (34)		
Professional/commercial/technical school	8.6 (91)	7.4 (80)		
University	9.0 (95)	9.3 (100)		
No completed schooling	1.1 (12)	2.0 (22)		
No formation	42.1 (445)	46.3 (500)		
Out of school	0.9 (10)	1.2 (13)		
Specialized cursus	1.5 (16)	0.9 (10)		
Other	0.8 (8)	0.3 (3)		
			$\chi^2(7) = 52.370$	<.001

(*continued on next page*)

Table 1 (*continued*)

	Patients with NON-Hospitalization*N* = 1059	Patients with Hospitalization*N* = 1083	Statistics	*P*-value
Professional activity, % (N)				
Apprentice	14.9 (148)	10.0 (99)		
Full-time worker	18.3 (181)	14.0 (138)		
Part-time worker	8.5 (84)	6.6 (65)		
Household activity	2.8 (28)	2.3 (23)		
Unemployed	27.6 (274)	31.2 (308)		
Retired or equivalent	2.2 (22)	7.6 (75)		
Invalidity Insurance	19.8 (196)	23.1 (228)		
Other	5.9 (58)	5.1 (50)		
Legal representative, % (N)			$\chi^2(3) = 8.844$	.031
Him/herself	90.5 (904)	89.0 (878)		
Parents	1.4 (14)	1.0 (10)		
Curatorship	7.2 (72)	9.7 (96)		
Other	0.9 (9)	0.2 (2)		
Sexual orientation, % (N)			Fisher's exact test	.472
Hétérosexual	95.9 (824)	95.3 (793)	$\chi^2(1) = 4.330$	.037
Homosexual	3.3 (29)	2.9 (24)		
Bisexual	0.8 (7)	0.4 (3)		
Evoked uncertainty	0.7 (6)	1.3 (11)		
Other	0.1 (1)	0.1 (1)		
Physical pain, % (N)	20.9 (206)	24.8 (236)		
Yes	79.1 (782)	75.2 (715)		
No				
Disabling physical illness, % (N)			$\chi^2(1) = 4.770$	.029
Yes	13.9 (132)	17.5 (164)		
No	86.1 (821)	82.5 (773)		
Method of self-harm, % (N)			Fisher's exact test	<.001
Self-poisoning (medication)	62.2 (657)	54.4 (589)		
Self-poisoning (other substance)	3.9 (41)	3.5 (38)		
Cutting	14.3 (151)	11.9 (129)		
Firearm	0.0 (0)	0.6 (6)		
Jumping from a height	4.7 (50)	8.2 (89)		
Hanging or asphyxiation	6.1 (64)	8.2 (89)		
Drowning	0.7 (7)	1.7 (18)		
Jumping/lying in front of a moving object	1.6 (17)	3.9 (42)		
Multiple methods	2.7 (28)	4.6 (50)		
Other	0.6 (6)	0.3 (3)		
Burning and immolation	0.6 (6)	1.5 (16)		
Physical auto-aggressiveness	1.2 (13)	0.6 (7)		
Ingestion of a foreign object	1.5 (16)	0.6 (7)		
Self-Injury VS self-poisoning, % (N)			$\chi^2(3) = 22.400$	<.001
Self-poisoning	66.1 (698)	58.1 (628)	$\chi^2(5) = 29.360$	<.001
Self-Injury	31.6 (334)	38.2 (414)		
Both	1.5 (16)	3.4 (37)		
Other	0.8 (8)	0.3 (3)		
Location at the time of the self-harm episode, % (N)	74.1 (778)	67.6 (721)		
Home	1.0 (11)	0.8 (8)		
Workplace/school	11.9 (125)	11.5 (123)		
Medical/social institution, prison	7.4 (78)	13.5 (144)		
Public space	1.4 (15)	3.1 (33)		
Isolated place	4.1 (43)	3.5 (37)		
Other				
Level of suicidal intent, % (N)			$\chi^2(2) = 388.399$	<.001
Clear suicidal intent	30.5 (320)	70.3 (747)		
Unclear suicidal intent	33.1 (348)	22.1 (235)		
No suicidal intent	36.4 (382)	7.6 (81)		
Seriousness of the episode, % (N)			$\chi^2(1) = 97.382$	<.001
Particularly serious episode	9.4 (97)	26.0 (273)		
Standard episode	90.6 (931)	74.0 (777)		
Arrival at the ER, % (N)			$\chi^2(5) = 10.941$	.053
Alone, on its own initiative	12.9 (131)	11.1 (115)		
With family/friends, on their impulse	21.4 (218)	17.9 (185)		
By ambulance, called by the patient	6.8 (69)	5.5 (57)		
By ambulance, called by other	45.6 (464)	52.4 (543)		
With the police, called by the patient	1.5 (15)	1.5 (16)		
With the police, called by other	11.8 (120)	11.6 (120)		
Intoxication at the time of the episode, % (N)			$\chi^2(1) = 0.356$	.551
Non intoxicated	59.6 (600)	60.9 (604)		
Intoxicated	40.4 (406)	39.1 (387)		
Use of substance during the last 3 months, median (IQR*)				
Alcohol	3.00 (3.00)	2.00 (1.00)	U = 243914.500	.651
Cannabis	1.00 (1.00)	2.00 (1.00)	U = 210823.000	.934
Unprescribed medicine	1.00 (0.00)	2.00 (1.00)	U = 154301.500	.349
Cocaine	1.00 (0.00)	2.00 (1.00)	U = 226106.000	.142

(*continued on next page*)

Table 1 (*continued*)

	Patients with NON-Hospitalization*N* = 1059	Patients with Hospitalization*N* = 1083	Statistics	*P*-value
Opiates	1.00 (0.00)	2.00 (1.00)	U = 204188.500	.004
Tabac	5.00 (4.00)	2.00 (1.00)	U = 49649.000	.388
Significant recent event, harassment at work/mobbing, % (N)	5.9 (29)	9.5 (40)	$\chi^2(1) = 4.032$	.045
Yes	94.1 (460)	90.5 (383)		
No				
			Fisher's exact test	< .001
Pre- self-harm episode follow-up, % (N)	26.5 (278)	19.5 (209)		
None	16.0 (168)	13.3 (142)		
General practitioner	24.5 (258)	29.3 (314)		
Outpatient public psychiatry network	30.7 (323)	29.9 (320)		
Psychologist or psychiatrist in private practice	1,1 (12)	1.7 (18)		
Other healthcare professional	0.6 (6)	3.6 (38)		
Voluntary psychiatric hospitalization	0.1 (1)	1.2 (13)		
Involuntary psychiatric hospitalization	0.2 (2)	0.6 (6)		
Psychiatric hospitalization, unspecified	0.1 (1)	0.7 (8)		
Non-psychiatric hospitalization (liaison)	0.2 (2)	0.2 (2)		
Social worker				
Realization level of the self-harm episode, % (N)			$\chi^2(2) = 4.025$	.134
Completed	68.3 (289)	69.7 (338)		
Interrupted	18.2 (77)	20.8 (101)		
Aborted	13.5 (57)	9.5 (46)		
Significant recent event, Professional Breakdown, % (N)			$\chi^2(1) = 4.913$	.027
Yes	10.8 (44)	16.0 (72)		
No	89.2 (362)	84.0 (377)		

* IQR = interquartile range

clinicians have a higher propensity to hospitalize older people, but this result may also be explained by unmeasured differences in the quality of the social and care network for the elderly (e.g., a poor social network would more often favour hospitalisation in the older population).

At the clinical level, diagnosis and suicide-related factors also had an influence on the decision to hospitalise. Not surprisingly, major psychopathological conditions such as depression, mania, dementia, and schizophrenia were predictive of hospitalisation. Independently of the suicidal process, such conditions often need intensive care, which is best provided in an inpatient setting. At the opposite end, anxiety disorders, substance use, and personality disorder were associated with a lower rate of hospitalisation. Substance use (mainly alcohol in our sample) is associated with proximal and distal suicidal risk of suicide and could as such have been an argument for hospitalisation. In a previous study, Salles et al. (2018) found that alcohol use disorder was not associated with psychiatric admission, as opposed to depression, and questioned the existence of stigmatisation of alcohol users to explain this. Our results go further in this direction, and therefore we recommend that clinicians should be aware of such biases when evaluating substance users. Regarding personality disorders, there has been much debate in the literature on the place and usefulness of hospitalisation but it is not a first-line choice, especially when suicidality is chronic (Perlman et al., 2011, Paris, 2019). Suicide-related factors showed that serious SA and a clear intent to die were associated with a higher rate of hospitalisation, an expected result in line with previous research (Baca-García et al., 2004).

Our results show that several factors are significantly more frequent in the hospitalisation group but not independently associated with it in the logistic regression model. These factors (migration, having children, level of education, having a legal representative, suffering from physical pain or a disabling physical illness, and existence of a recent professional breakdown) are thus likely associated as determinants or modulators with other clinical predictors. Clinicians should pay attention to their presence. Socio-economic situation, on the other hand, was another predictor for the decision to hospitalise, which may reflect the fact that a poor socioeconomic condition was associated with a poor social network and the difficulty in finding support for outpatient treatment (Costanza et al., 2021). We found no similar results in the literature on treatment decision after SH or SA, but studies on treatment decisions in psychiatric EDs found that social support, friends, and not being homeless (Hugo et al., 2002), as well as a high degree of "social integration" (Schnyder et al., 1999), favoured outpatient treatment; these factors were not measured in our study and may have been associated with the socio-economic condition. Poor socio-economic situation may be associated with loneliness and favour interpersonal difficulties in a vicious circle that creates perceived burdensomeness – a known risk factor for SH (Hugo et al., 2002, Baertschi et al., 2017). This underlies the importance of considering social issues when assessing suicidal people and determining their level of social support, which sometimes can replace hospitalisation. Specifically, the presence of caregivers and their degree of involvement to help their relative is of utmost importance when deciding on outpatient versus inpatient treatment (Association, 2003, Ryan et al., 2015). Mental health professionals should thus actively include this dimension in treatment planning and involve social workers in their teams.

4.2. *Predictors of compulsory admissions*

In Switzerland, compulsory admission is allowed when (i) a psychiatric disorder, a mental deficiency, or a serious neglect is identified, (ii) there is a need for treatment, and (iii) no alternative exists to hospitalisation (Confederation TFAotS 2017). The most striking result of our research was that one of the factors that was strongly associated with compulsory admissions did not depend on the profile of the patients but rather was related to the health system in which they were treated. Indeed, we observed a quasi-threefold difference (8.4% in the Valais versus 22.3% at Neuchâtel) of compulsory hospitalisation rates depending on the ED where the patient was assessed after a SH or a SA. This observation was in line with the results of a previous Swiss study (Morandi et al., 2020). The latter showed that after a SA, doctors in the canton of Neuchâtel were more prone to opt for a compulsory hospitalisation than their colleagues from other French-speaking cantons. However, their propensity to decide on involuntary hospitalisation after a SA was not related to their use of coercion in other situations. In this

Table 2
Comparison between follow-up by other measures or compulsory hospitalization for patients after a SH episode ($N == 2142$).

	Patients with other measures$N$ = 1785	Patients with involuntary hospitalization$N$ = 357	Statistics	P-value
Sites, % (N)			Fisher's exact test	< .001
Lausanne	80.8 (918)	19.2 (218)		
Geneva	90.8 (197)	9.2 (20)		
Geneva Malatavie	100.00 (19)	0.0 (0)		
Neuchatel	77.7 (304)	22.3 (87)		
Valais	91.6 (347)	8.4(32)		
Gender, % (N)			Fisher's exact test	.161
Male	41.3 (737)	45.9 (164)		
Female	58.5 (1045)	53.8 (192)		
Other	0.2 (3)	0.3 (1)		
Diagnostic, % (N)			Fisher's exact test	<.001
Dementia F0	0.5 (9)	0.6 (2)		
Alcohol use F10	4.9 (83)	4.4 (15)		
Substance use F11-F19	2.4 (41)	2.7 (9)		
Schizophrenia F2	6.4 (107)	11.5 (39)		
Mania F3-M	1.7 (28)	5.0 (17)		
Depression F3-D	29.6 (497)	39.2 (133)		
Anxiety F4	26.7 (449)	15.0 (51)		
Behavioral syndromes assoc. w. physiological disturbances F7-F9	2.3 (39)	2.1 (7)		
Personality disorder F6	25.4 (426)	19.5 (66)		
Age, Mean (SD)	37.99 (14.601)	39.72 (15.710)	t(2139) = -2.009	.045
Legal status, % (N)			Fisher's exact test	.117 .983
Swiss nationality	70.6 (968)	71.8 (191)		
Legally transiting in Switzerland	1.2 (16)	1.1 (3)	$\chi^2(2)$ = 0.034	
Permit B	6.1 (83)	6.0 (16)		
Permit C	10.1 (138)	9.8 (26)		
Permit F	1.5 (21)	0.4 (1)		
Permit L	0.7 (9)	0.4 (1)		
Permit N	2.0 (27)	0.0 (0)		
NEM Status	1.5 (21)	3.8 (10)		
Clandestine	3.9 (53)	3.8 (10)		
Other	2.3 (32)	3.0 (8)		
Migration, % (N)	74.3 (1066)	74.2 (207)		
no migration	18.3 (262)	18.6 (52)		
selected migration	7.4 (106)	7.2 (20)		
forced migration				
Socioeconomic situation, % (N)			$\chi^2(1)$ = 7.559	.006
Non-problematic	41.5 (641)	32.7 (91)		
Problematic	58.5 (903)	67.3 (187)		
Lifestyle, % (N)			$\chi^2(8)$ = 8.752	.364
By him/herself	25.4 (451)	29.5 (103)		
Couple without children	15.6 (276)	14.3 (50)		
Couple with children	21.8 (387)	20.1 (70)		
By his or her parents	13.0 (230)	13.8 (48)		
Shared accommodation	3.9 (69)	4.3 (15)		
Foster care, institution for the elderly, etc.	8.0 (141)	8.3 (29)		
Incarcerated	7.2 (128)	3.7 (13)		
Homeless	2.0 (36)	2.6 (9)		
Other	3.1 (55)	3.4 (12)		
Civil status, % (N)			$\chi^2(4)$ = 4.053 $\chi^2(1)$ = 0.729	.399 .393
Single	52.5 (902)	54.3 (183)		
Married or registered partnership	24.2 (416)	20.8 (70)		
Divorced	14.2 (244)	14.8 (50)		
Separated	6.6 (114)	6.2 (21)		
Widowed	2.4 (41)	3.9 (13)		
Children, % (N)	47.4 (806)	44.8 (148)		
Yes	52.6 (894)	55.2 (182)		
No				
Level of education, % (N)			Fisher's exact test	.700
Compulsory schooling	25.4 (258)	21.0 (37)		
Apprenticeship	29.3 (298)	31.3 (55)		
Maturity diploma	7.0 (71)	8.0 (14)		
Professional/ commercial/ technical school	14.6 (148)	13.1 (23)		
University	15.9 (162)	18.8 (33)		
No completed schooling	2.7 (27)	4.0 (7)		
Out of school	1.9 (19)	2.3 (4)		
Specialized cursus	2.3 (23)	1.7 (3)		
Other	1.1 (11)	0.0 (0)		
Professional activity, % (N)			$\chi^2(7)$ = 18.162	.011
Apprentice	12.6 (211)	11.7 (36)		
Full-time worker	16.5 (276)	14.0 (43)		
Part-time worker	7.5 (126)	7.5 (23)		
Household activity	2.9 (49)	0.6 (2)		
Unemployed	29.2 (488)	30.5 (94)		
Retired or equivalent	4.2 (70)	8.8 (27)		
Invalidity Insurance	21.6 (360)	20.8 (64)		
Other	5.3 (89)	6.2 (19)		
Legal representative, % (N)			Fisher's exact test	.093
Him/herself	89.9 (1495)	89.1 (287)		
Parents	1.4 (23)	0.3 (1)		
Curatorship	8.1 (134)	10.6 (34)		
Other	0.7 (11)	0.0 (0)		
Physical pain, % (N)			$\chi^2(1)$ = 097	.756
Yes	22.7 (372)	23.5 (70)		
No	77.3 (1269)	76.5 (228)		
Disabling physical illness, % (N)			$\chi^2(1)$ = 0.137	.711
Yes	15.8 (251)	15.0 (45)		
No	84.2 (1338)	85.0 (256)		
Method of SH, % (N)			Fisher's exact test	.001
Self-poisoning (medication)	59.9 (1067)	50.1 (179)		
Self-poisoning (other substance)	3.7 (66)	3.6 (13)		
Cutting	13.5 (240)	11.2 (40)		
Firearm	0.2 (4)	0.6 (2)		
Jumping from a height	5.7 (101)	10.6 (38)		
Hanging or asphyxiation	6.7 (120)	9.2 (33)		
Drowning	1.2 (21)	1.1 (4)		
Jumping/lying in front of a moving object	3.4 (41)	5.0 (18)		
Multiple methods	3.4 (61)	4.8 (17)		
Other	0.4 (8)	0.3 (1)		
Burning and immolation	0.9 (16)	1.7 (6)		
Physical auto-aggressiveness	0.9 (16)	1.1 (4)		
Ingestion of a foreign object	1.2 (21)	0.6 (2)		
				.021

(continued on next page)

Table 2 (*continued*)

	Patients with other measures*N* = 1785	Patients with involuntary hospitalization*N* = 357	Statistics	*P*-value
Location at the time of the SH episode, % (N)	71.7 (1266)	66.6 (233)	Fisher's exact test	
Home	1.0 (17)	0.6 (2)		
Workplace/school	12.0 (212)	10.3 (36)		
Medical/social institution, prison	9.6 (170)	14.9 (52)		
Public space	2.0 (35)	3.7 (13)		
Isolated place	3.7 (66)	4.0 (14)		
Other				
Level of suicidal intent, % (N)	45.9 (810)	73.6 (257)	$\chi^2(2) =$ 94.856	<.001
Clear suicidal intent	29.4 (518)	18.6 (65)		
Unclear suicidal intent	24.7 (436)	7.7 (27)		
No suicidal intent				
Seriousness of the SH episode, % (N)	15.0 (259)	31.9 (111)	$\chi^2(1) =$ 56.710	<.001
Particularly serious episode	85.0 (1471)	68.1 (237)		
Standard episode				
Arrival at the ED, % (N)	13.0 (222)	7.0 (24)	$\chi^2(5) =$ 36.660	<.001
Alone, on its own initiative	20.9 (358)	13.2 (45)		
With family/ friends, on their impulse	6.3 (108)	5.3 (18)		
By ambulance, called by the patient	47.8 (818)	55.4 (189)		
By ambulance, called by other	1.6 (28)	0.9 (3)		
With the police, called by the patient	10.4 (178)	18.2 (62)		
With the police, called by other				
Intoxication at the time of the episode, % (N)	61.1 (1022)	56.3 (182)	$\chi^2(1) =$ 2.503	.114
Non intoxicated	38.9 (652)	43.7 (141)		
Intoxicated				
Use of substance during the last 3 months, median (IQR*)	2.00 (3.00)	4.00 (3.00)	U = 113407.000	.032
Alcohol	1.00 (0.00)	1.00 (0.00)	U = 102400.500	.147
Cannabis	1.00 (0.00)	1.00 (0.00)	U = 73023.500	.578
Unprescribed medicine	1.00 (0.00)	1.00 (0.00)	U = 110448.000	.239
Cocaine	1.00 (4.00)	1.00 (4.00)	U = 101539.000	.332
Opiates			U = 19314.000	.117
Tabac				
Pre-SH episode follow-up, % (N)	23.3 (413)	21.3 (74)	Fisher's exact test	<.001
None	15.2 (269)	11.8 (41)		
General practitioner	26.5 (469)	29.6 (103)		
Outpatient public psychiatry network	30.7 (544)	28.4 (99)		
Psychologist or psychiatrist in private practice	1.5 (26)	1.1 (4)		
Other healthcare professional	1.7 (30)	4.0 (14)		
Voluntary psychiatric hospitalization	0.2 (4)	2.9 (10)		
Involuntary psychiatric hospitalization	0.3 (6)	0.6 (2)		
Psychiatric hospitalization, unspecified	0.5 (9)	0.0 (0)		
Non-psychiatric hospitalization (liaison)	0.2 (3)	0.3 (1)		
Social worker				
Realization level of the SH episode, % (N)	69.0 (495)	69.1 (132)	$\chi^2(2) =$ 8.551	.014
Completed	18.3 (131)	24.6 (47)		
Interrupted	12.7 (91)	6.3 (12)		
Aborted				
Significant past event, hetero-aggressivity, % (N)	27.7 (242)	36.9 (52)	$\chi^2(1) =$ 5.022	.025
Yes	72.3 (633)	63.1 (89)		
No				
Significant recent event, love break-up, % (N)	24.6 (381)	30.4 (87)	$\chi^2(1) =$ 4.258	.039
Yes	75.4 (1166)	69.9 (199)		
No				

Legend: SH=self-harm

* IQR = interquartile range

study, medical doctors' propensity to use coercion for mental health problems was better accounted for by situational rather than dispositional factor. The Swiss Health Observatory regularly reports large differences between cantons in the incidence of compulsory psychiatric admissions (Swiss Health Observatory 2022). These differences seem to be mainly explained by the organisation of local mental health services and specific institutional cultures rather than by legal provisions, rates of psychiatric hospitalisation, or the degree of urbanization of the canton (Schuler et al., 2018).

These peculiar result showing major inter-sites differences both in general hospitalization rate (see above Section 4.1) and in compulsory hospitalization's rate deserves some additional thoughts. First, in the cantons where the study was conducted, EDs are not the only places where patients are assessed after SH. Indeed, if the patient does not require somatic assessment or care, an on-call doctor may conduct the clinical examination and decide on the clinical orientation of the patient. Therefore, the organization of the health care system may partly explain the differences observed between the sites, as not all of them receive all the target populations. Second, the workload faced by the EDs professionals who receive patients after SH and the availability and support offered by other health services (e.g. crisis team, liaison psychiatry services) may vary between sites and have an influence: clinically assessing patients and, if necessary, organizing outpatient follow-up rather than hospitalization can take up a considerable amount of time for the EDs teams, meaning that overwhelmed staff may favour (compulsory) admission over outpatient treatment. We do not have reliable measures of possible overloading of the staff participating in the study but this could be an interesting further research question. Furthermore, availability of psychiatric beds certainly have an influence on the staff's propensity to hospitalize patients. The high hospitalization rate in Neuchâtel may thus be partly related to the fact that, during the study period in this canton, there was a high number of unoccupied beds, a situation with an important cost for the hospital. Third, health

policies and institutional settings may also influence whether or not a patient is hospitalized after a SH episode, and how and when to decide on a compulsory hospitalization. Doctors who have to make decisions may fear the consequences of letting a patient go home rather than hospitalizing him or her, if the patient repeats the attempt or die by suicide. This may be influenced by the way institutions manage risk-taking and their culture of error (Silva et al., 2018). Fourth, the training of doctors and their collaboration with the health and judicial authorities can also influence medical practices in terms of whether or not to resort to hospitalizations. For example and specifically regarding compulsory hospitalization, the canton of Vaud has developed, since 2017, training courses for doctors likely to decide on involuntary hospitalizations. Doctors' meetings with judges and joint training courses have also been set up. These measures have contributed to a significant reduction in the number of involuntary hospitalizations in the canton, which had previously been on the increase (Sundvall et al., 2015). Fifth and finally yet importantly, this difference probably reflects institutional historical and "cultural" differences between cantons and sites. For example, the canton Valais showing the lower rates of both general and compulsory hospitalization has a long-standing tradition of open wards in psychiatric hospitals. Such differences could be further explored through ethnographic or qualitative studies.

On a patient level, factors associated with a compulsory admission after a SH episode or a SA were related to the diagnosis and to the process of SH or SA (location, level of suicidal intent, seriousness of the episode, and mode of arrival at the ED). These results were only partially consistent with previous research. Indeed, while diagnoses of schizophrenia and bipolar disorder have frequently been identified as factors associated with compulsory hospitalisation, depression was generally considered a protective factor (Walker et al., 2019, Silva et al., 2018). These differences could be explained by the fact that in studies comparing populations hospitalised voluntarily and under compulsion, a SH episode or a SA did not occur in the majority of situations of patients hospitalised with a diagnosis of depression and that, consequently, the populations observed are not identical to that of the present research. As discussed above, after a SH episode or a SA, a diagnosis of depression, as well as schizophrenia and mania, would obviously increase the need for a treatment. Our results show that they also affect the patient's and the clinician's appreciation of the existence of a psychiatric disorder (e.g., anosognosia in manic or delusional patients) or of the need for treatment (e.g., highly suicidal melancholic patients believing that getting better is impossible). The fact that the intent to die and the seriousness of the SA were also independently associated with compulsory hospitalisation is certainly also reflective of the fact that highly suicidal people may have lost hope in the possibility of being helped and thus refuse care proposals, and in this case hospitalisation.

Very few of the socio-demographic and contextual factors were significantly different between the two groups (professional activity, past hetero-aggression, recent break-up) and only professional activity was predictive of compulsory hospitalisation in the multiple model (i.e., being retired was protective against compulsory hospitalisation). This is an interesting and quite reassuring result since it means that the crucial decision of compulsory admission, thus overriding the patient's wishes, was mainly based on clinical factors and does not seem to be influenced by unconscious biases that are based on other personal characteristics. This is in contrast to some previous research which showed, for example, that forced migration may have an independent influence on the choice of allocated care (Sundvall et al., 2015).

4.3. Limitations

Our study suffers from several limitations. First, some significant variables were excluded from the multiple regression model (realisation level of the SH episode and a significant past event such as hetero-aggression or a break-up). In addition, there was a non-trivial amount of missing data. Second, multiple separate statistical analyses were performed in the present study, increasing the risk of false positive results. Correction for separate hypothesis-driven tests were not necessarily indicated in this instance because we did not have a universal null hypothesis predicting no difference across all variables of the different tests performed. As a result, the risk of type one error has to be borne in mind when interpreting the associations that were identified. Third, our study design is cross-sectional and future longitudinal studies should strengthen our findings. Fourth, we collected our data through the usual psychiatric assessment and thus relied on clinical diagnosis rather than structured and formalised instruments, such as the Columbia-Suicide Severity Rating Scale (C-SSRS) (Posner et al., 2008), which could have strengthen our results and may on the other hand deepen suicidal risk assessment in EDs. The decision not to use such an instrument was based on feasibility (this would have add a significant workload to the residents participating in the study), and on the fact that current suicide risk assessment in the participating hospitals do not rely on such instruments. The same is true for data on suicide-related factors and for other variables which were not proactively explored (e.g., socioeconomic conditions, sexual orientation, and legal representation). Fifth, we did not measure clinician-related factors, which may undoubtedly have an important influence on therapeutic decisions. In particular, previous research showed that suicidal patients may elicit very high emotional reactions in the clinician (Michaud et al., 2021), especially in the emergency setting (Michaud et al., 2020). Given the fact that such emotions have a major role in clinical decision-making (Kozlowski et al., 2017) and that unrecognised emotional reactions from clinicians may lead to inappropriate treatment decisions (da Silva and Carvalho, 2016), further research should consider including measures on this aspect. Sixth, longitudinal examination of our data showed substantial differences in the number of SH episodes per year in the different sites that cannot be attributed to natural fluctuations and must be related to recruitment data. It is possible that this had an influence on the observed inter-site differences (e.g., one site tending to include more comprehensively selected types of SH).

4.4. Practical and clinical implications

Our results have several practical and clinical implications. On a training level, clinicians should be made aware of the fact that their medical decision of voluntary or compulsory hospitalization after an SH are influenced by factors such as gender, age or addictive behaviours. The specific clinical factors identified could contribute to the identification of sub-groups of suicidal populations with distinctive characteristics, such as is the case with substance abuse patients, with the ultimate goal of being able to refine prevention and treatment strategies. For example, specific courses could be developed on the admission decision process, focusing on the factors we identified, and specific interventions could target suicidal patients with substance abuse. On a more organizational level, the fact that the inter-sites differences in the frequency of hospitalization (voluntary or compulsory) is certainly partly explained by cultural and institutional differences speaks for the development of exchanges between psychiatric staff in the EDs on their management of critical situations and on the care programmes developed to reduce risks and propose alternatives to hospitalisation. This should allow optimising the use of the health system and lowering the use of coercion. Furthermore, the above-mentioned training courses developed in one canton to lower involuntary hospitalizations should be deployed in the sites where they are also high.

4.5. Conclusions

Our results shed light on the important differences between sites when considering the rates of compulsory psychiatric admission. They also show that, for the hospitalisation decision as well as for its compulsory nature, the decision seems to be mainly based on clinical factors. Our analysis was limited to the presence/absence of

(compulsory) hospitalisation and future studies could (i) be extended to other types of follow-up, and (ii) include a longitudinal component. Longitudinal outcome measures such as repetition of SH and death by suicide should be compared against the decision to hospitalise or proposal of an outpatient treatment in order to identify which patients benefit from which type of care setting. Psychiatric EDs have an important public health role, as they are frequently the first contact with psychiatry for highly vulnerable patients. Our research gives some insight into the factors that should be considered by clinicians when deciding whether to involuntarily hospitalise a patient.

Ethics approval and consent to participate

This study was conducted without the explicit consent of patients. This issue was given full consideration and the relevant cantonal ethics committees on human research approved the project (Human Research Ethics Committee of the Canton Vaud protocol no. 2016-01489). We argued that requesting consent would have introduced a selection bias. All methods were carried out in accordance with the recommendations of the Human Research Ethics Committee of the Canton Vaud and the Declaration of Helsinki.

Consent for publication

Not Applicable.

Availability of data and materials

The datasets generated and analysed during the current study are not publicly available because public archiving of data was not explicitly authorised by the ethics committee. Nevertheless, anonymous data are available from the corresponding author on reasonable request.

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CRediT authorship contribution statement

Laurent Michaud: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Writing – original draft, Writing – review & editing. **Sébastien Berva:** Conceptualization, Investigation, Methodology, Writing – original draft. **Louise Ostertag:** Data curation, Formal analysis, Investigation, Software, Writing – review & editing. **Alessandra Costanza:** Resources, Writing – review & editing. **Bénédicte Van der Vaeren:** Resources, Writing – review & editing. **Yves Dorogi:** Resources, Writing – review & editing. **Stéphane Saillant:** Funding acquisition, Project administration, Resources, Writing – review & editing. **Philippe Golay:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. **Stéphane Morandi:** Conceptualization, Investigation, Methodology, Supervision, Validation, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no competing interests.

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References

Akther, S.F., Molyneaux, E., Stuart, R., Johnson, S., Simpson, A., Oram, S., 2019. Patients' experiences of assessment and detention under mental health legislation: systematic review and qualitative meta-synthesis. Bjpsych. Open 5 (3).
Assessment and management of patients at risk for suicide: synopsis of the 2019 U.S. department of veterans Affairs and U.S. Department of Defense Clinical Practice Guidelines. Ann. Intern. Med. 171 (5), 2019, 343–353.
Association A.P. Practioce guideline for the assessment and treatment of patients with suicidal behaviors. 2003.
Baca-García, E., Diaz-Sastre, C., Resa, E.G., Blasco, H., Conesa, D.B., Saiz-Ruiz, J., et al., 2004. Variables associated with hospitalization decisions by emergency psychiatrists after a patient's suicide attempt. Psychiatr. Serv. 55 (7), 792–797.
Baertschi, M., Costanza, A., Richard-Lepouriel, H., Pompili, M., Sarasin, F., Weber, K., et al., 2017. The application of the interpersonal-psychological theory of suicide to a sample of Swiss patients attending a psychiatric emergency department for a non-lethal suicidal event. J. Affect. Disord. 210, 323–331.
Barrigon, M.L., Cegla-Schvartzman, F., 2020. Sex, gender, and suicidal behavior. In: Baca-Garcia, E. (Ed.), Behavioral Neurobiology of Suicide and Self Harm. Springer International Publishing, Cham, pp. 89–115.
Bastiampillai, T., Sharfstein, S.S., Allison, S., 2016. Increase in US suicide rates and the critical decline in psychiatric beds. JAMA 316 (24), 2591–2592.
Beautrais, A.L., 2001. Suicides and serious suicide attempts: two populations or one? Psychol. Med. 31 (5), 837–845.
Beautrais, A.L., 2003. Suicide and serious suicide attempts in youth: a multiple-group comparison study. Am. J. Psychiatry 160 (6), 1093–1099.
Canuso, C.M., Ionescu, D.F., Li, X., Qiu, X., Lane, R., Turkoz, I., et al., 2021. Esketamine nasal spray for the rapid reduction of depressive symptoms in major depressive disorder with acute suicidal ideation or behavior. J. Clin. Psychopharmacol. 41 (5), 516–524.
Christiansen, E., Frank Jensen, B., 2007. Risk of repetition of suicide attempt, suicide or all deaths after an episode of attempted suicide: a register-based survival analysis. Aust. N. Z. J. Psychiatry 41 (3), 257–265.
Confederation TFAotS. Swiss Civil Code 2017 [Available from: https://www.admin.ch/opc/en/classified-compilation/19070042/201701010000/210.pdf.
Costanza, A., Amerio, A., Aguglia, A., Serafini, G., Amore, M., Macchiarulo, E., et al., 2021. From "The Interpersonal Theory of Suicide" to "The Interpersonal Trust": an unexpected and effective resource to mitigate economic crisis-related suicide risk in times of Covid-19? Acta Bio-med. 92 (S6), e2021417.
Da Cruz, D., Pearson, A., Saini, P., Miles, C., While, D., Swinson, N., et al., 2011. Emergency department contact prior to suicide in mental health patients. J. Emerg. Med. 28 (6), 467–471.
da Silva, J.V., Carvalho, I., 2016. Physicians experiencing intense emotions while seeing their patients: what happens? Permanente J. 20 (3), 31.
Eurostat. Psychiatric care beds in hospitals [Available from: https://ec.europa.eu/eurostat/databrowser/view/tps00047/default/bar.
Geulayov, G., Kapur, N., Turnbull, P., Clements, C., Waters, K., Ness, J., et al., 2016. Epidemiology and trends in non-fatal self-harm in three centres in England, 2000–2012: findings from the Multicentre Study of Self-harm in England. BMJ open 6 (4), e010538.
Gvion, Y., Levi-Belz, Y., 2018. Serious suicide attempts: systematic review of psychological risk factors. Front. Psychiatry 9, 56.
Hawton, K., Zahl, D., Weatherall, R., 2003. Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. Br. J. Psychiatry 182, 537–542.
Health NSWDo. Suicide risk assessment and management protocols: for NSW health staff. Retrieved from http://www.health.nsw.gov.au/pubs/2005/suicide_risk.html; 2004.
Hepp, U., Moergeli, H., Trier, S.N., Milos, G., Schnyder, U., 2004. Attempted Suicide: Factors Leading to Hospitalization. Can. J. Psychiatry 49 (11), 736–742.
Hugo, M., Smout, M., Bannister, J., 2002. A comparison in hospitalization rates between a community-based mobile emergency service and a hospital-based emergency service. Aust. N. Z. J. Psychiatry 36 (4), 504–508.
Jordan, J.T., McNiel, D.E., 2020. Perceived coercion during admission into psychiatric hospitalization increases risk of suicide attempts after discharge. Suicide Life Threat. Behav. 50 (1), 180–188.
Kapur, N., House, A., Creed, F., Feldman, E., Friedman, T., Guthrie, E., 1998. Management of deliberate self poisoning in adults in four teaching hospitals: descriptive study. BMJ 316 (7134), 831–832.
Kapur, N., Ibrahim, S., While, D., Baird, A., Rodway, C., Hunt, I.M., et al., 2016. Mental health service changes, organisational factors, and patient suicide in England in 1997–2012: a before-and-after study. Lancet Psychiatry 3 (6), 526–534.
Khatib, A., Ibrahim, M., Roe, D., 2018. Re-building trust after physical restraint during involuntary psychiatric hospitalization. Arch. Psychiatr. Nurs. 32 (3), 457–461.
Kozlowski, D., Hutchinson, M., Hurley, J., Rowley, J., Sutherland, J., 2017. The role of emotion in clinical decision making: an integrative literature review. BMC Med. Educ. 17 (1), 255.
Large, M.M., Ryan, C.J., 2014. Disturbing Findings About the Risk of Suicide and Psychiatric Hospitals. Springer.
Larkin, G.L., Beautrais, A.L., 2010. Emergency departments are underutilized sites for suicide prevention. Crisis 31 (1), 1–6.
Michaud, L., Brovelli, S., Bourquin, C., 2021. [The gender paradox in suicide: some explanations and much uncertainty]. Rev. Med. Suisse 17 (744-2), 1265–1267.
Michaud, L., Greenway, K.T., Corbeil, S., Bourquin, C., Richard-Devantoy, S., 2021. Countertransference towards suicidal patients: a systematic review. Curr. Psychol.

Michaud, L., Ligier, F., Bourquin, C., Corbeil, S., Saraga, M., Stiefel, F., et al., 2020. Differences and similarities in instant countertransference towards patients with suicidal ideation and personality disorders. J. Affect. Disord. 265, 669–678.
Miret, M., Nuevo, R., Morant, C., Sainz-Cortón, E., Jiménez-Arriero, M., López-Ibor, J.J., et al., 2011. The role of suicide risk in the decision for psychiatric hospitalization after a suicide attempt. Crisis 32 (2), 65–73.
Morandi, S., Silva, B., Bonsack, C., Golay, P., 2020. Propensity to decide on involuntary hospitalisation in primary medical care: Dispositional or situational determinants? Int. J. Law Psychiatry 69.
Mueser, K.T., Lu, W.L., Rosenberg, S.D., Wolfe, R., 2010. The trauma of psychosis: posttraumatic stress disorder and recent onset psychosis. Schizophr. Res. 116 (2-3), 217–227.
Ostertag, L., Golay, P., Dorogi, Y., Brovelli, S., Bertran, M., Cromec, I., et al., 2019. The implementation and first insights of the French-speaking Swiss programme for monitoring self-harm. Swiss Med. Wkly. 149, w20016.
Owens, D., Horrocks, J., House, A., 2002. Fatal and non-fatal repetition of self-harm. Systematic review. Br. J. Psychiatry 181, 193–199.
Paris, J., 2019. Suicidality in borderline personality disorder. Medicina 55 (6), 223.
Perlman, C., Neufeld, E., Martin, L., 2011. Suicide Risk Assessment Guide: a Resource for Health Care Organizations. Ontario Hospital and Canadian Patient Safety Institute, Toronto, ON.
Posner, K., Brent, D., Lucas, C., Gould, M., Stanley, B., Brown, G., et al., 2008. Columbia-Suicide Severity Rating Scale (C-SSRS). Columbia University Medical Center, New York, NY, 10.
Ryan, CJ., Large, M., Gribble, R., Macfarlane, M., Ilchef, R., Tietze, T., 2015. Assessing and managing suicidal patients in the emergency department. Aust. Psychiatry 23 (5), 513–516.
Sadek, J., 2018. A Clinician's Guide to Suicide Risk Assessment and Management. Springer.
Salles, J., Calonge, J., Franchitto, N., Bougon, E., Schmitt, L., 2018. Factors associated with hospitalization after self-poisoning in France: special focus on the impact of alcohol use disorder. BMC Psychiatry 18 (1), 287.
Schnyder, U., Klaghofer, R., Leuthold, A., Buddeberg, C., 1999. Characteristics of psychiatric emergencies and the choice of intervention strategies. Acta Psychiatr. Scand. 99 (3), 179–187.
Schuler, D., Tuch, A., Peter, C., 2018. Placement en Établissement Psychiatrique à des fins d'assistance. Observatoire suisse de la santé, Neuchâtel.
Silva, B., Golay, P., Morandi, S., 2018. Factors associated with involuntary hospitalisation for psychiatric patients in Switzerland: a retrospective study. BMC Psychiatry 18.
Strauss, J.L., Zervakis, J.B., Stechuchak, K.M., Olsen, M.K., Swanson, J., Swartz, M.S., et al., 2013. Adverse impact of coercive treatments on psychiatric inpatients' satisfaction with care. Community Ment. Health J. 49 (4), 457–465.
Sundvall, M., Tidemalm, D.H., Titelman, D.E., Runeson, B., Bäärnhielm, S., 2015. Assessment and treatment of asylum seekers after a suicide attempt: a comparative study of people registered at mental health services in a Swedish location. BMC Psychiatry 15 (1), 235.
Suokas, J., Suominen, K., Isometsa, E., Ostamo, A., Lonnqvist, J., 2001. Long-term risk factors for suicide mortality after attempted suicide: findings of a 14-year follow-up study. Acta Psychiatr. Scand. 104 (2), 117–121.
Suominen, K., Isometsa, E., Suokas, J., Haukka, J., Achte, K., Lonnqvist, J., 2004. Completed suicide after a suicide attempt: a 37-year follow-up study. Am. J. Psychiatry 161 (3), 562–563.
Suominen, K., Lönnqvist, J., 2006. Determinants of psychiatric hospitalization after attempted suicide. Gen. Hosp. Psychiatry 28 (5), 424–430.
Swiss Health Observatory. Placements en établissement psychiatrique à des fins d'assistance - involuntary psychiatric admissions 2022 [Available from: https://ind.obsan.admin.ch/fr/indicator/obsan/placements-en-etablissement-psychiatrique-a-des-fins-dassistance.
Van Heeringen, C., Jannes, S., Buylaert, W., Henderick, H., De Bacquer, D., Van Remoortel, J., 1995. The management of non-compliance with referral to out-patient after-care among attempted suicide patients: a controlled intervention study. Psychol. Med. 25 (05), 963–970.
Van Veen, M., Wierdsma, A.I., van Boeijen, C., Dekker, J., Zoeteman, J., Koekkoek, B., et al., 2019. Suicide risk, personality disorder and hospital admission after assessment by psychiatric emergency services. BMC Psychiatry 19 (1), 157.
Walker, S., Mackay, E., Barnett, P., Rains, L.S., Leverton, M., Dalton-Locke, C., et al., 2019. Clinical and social factors associated with increased risk for involuntary psychiatric hospitalisation: a systematic review, meta-analysis, and narrative synthesis. Lancet Psychiatry 6 (12), 1039–1053.
World Health Organization, 2014. Preventing Suicide: a Global Imperative. World Health Organization, Geneva [Available from: http://apps.who.int/iris/bitstream/handle/10665/131056/9789241564779_eng.pdf?sequence=1.
World Health Organization, 2016. Practice Manual for Establishing and Maintaining Surveillance Systems for Suicide Attempts and Self-harm. World Health Organization, Geneva [Available from: http://apps.who.int/iris/bitstream/handle/10665/208895/9789241549578_eng.pdf;jsessionid=DB9894D3EC5DD66BE3521E9D66E8022C?sequence=1.