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Examining Readmission Factors in Psychiatric Emergency Care for Individuals With Personality Disorders: A 6-Year Retrospective Study

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People with personality disorders (PDs) are often admitted to psychiatric emergency services due to the frequent repetition of acute crises. This study drew on the ICD diagnostic records of 2,634 individuals with PDs who were admitted to a specialized inpatient psychiatric crisis unit over a 6-year period. Multiple logistic regressions and survival regressions were performed to examine whether PD categories, gender, and other individual, interpersonal, and precipitating factors were associated with readmission and time-to-readmission. The results showed a 16.1% readmission rate. Of these, 99.5% of readmissions occurred within 4 years following the first admission. Gender was the main factor associated with both readmission and time-to-readmission: while men were readmitted faster, more women in total were readmitted for a second psychiatric emergency hospitalization. Findings also indicated that readmission rate and time-to-readmission differed following the category of PD: readmission rate in a ratio of 1–2 (from 8% to 10% for dissocial and paranoid PD up to 19%–21% for impulsive and borderline PD), and time-to-readmission in a ratio of 1–5 (from 1 month for anankastic and dependent, to 5 months for impulsive, histrionic and anxious-avoidant PD). Limitations of this naturalistic study include a lack of self-reported measures and generalizability to less specialized emergency settings. Future research should include a prospective longitudinal design using standardized scalable measurement tools to improve the completeness and accuracy of the data concerning the psychological processes involved in risk and time-to-readmission after brief hospitalizations in emergency psychiatry.

Keywords: personality disorder, mental health crisis, psychiatric emergency hospitalization, readmission, resilience

Supplemental materials: https://doi.org/10.1037/per0000616.supp

The term personality disorder (PD) refers to a diversity of symptoms presented by people who experience difficulties in forming and maintaining satisfying interpersonal relationships. PDs are thought to reflect personal distress and psychosocial dysfunction that can have a serious impact on sufferers' well-being and health, in particular, due to recurrent crises and a high frequency of self-harming behavior that increase the risk of suicide (Chan et al., 2016; Flynn et al., 2020; Grenyer et al., 2018; Tyrer et al., 2015). With onset in adolescence and young adulthood, PDs are assumed to be chronic disorders, and their overall prevalence is estimated at 7.8% internationally (Winsper et al., 2020). As the presentation of symptoms in people with PD fluctuates over time, it is difficult for health practitioners to diagnose and care for these individuals, and individuals with PD are frequent users of the health care system, with prevalence estimated at 25% in primary care and 50% in outpatient psychiatry (Tyrer et al., 2015). Regarding inpatient care, a diagnosis of PD would increase by 2.75 the risk of admission to the general hospital (Fok et al., 2019), while the prevalence of PD among psychiatric inpatients is estimated at 40%–50% (Grenyer et al., 2018). Research also indicates that PD is associated with a higher risk for readmission, with a risk ratio compared with other mental disorders ranging from 1.55 at 1 month to 8.7 at 36 months (Evans et al., 2017; Lewis et al., 2019). Individuals with PD are also more likely to be readmitted in a shorter time than those with other mental disorders with a median time-to-readmission reduced by 1.53, and a readmission rate at 1 month that is 2.3 times higher than for other psychiatric disorders (Lewis et al., 2019; Lin et al., 2007). Consistent with both higher risk and shorter time-to-readmission, PD appears to be the only psychiatric diagnosis associated with rapid readmission in

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The French regulations that apply to the data of the participants in this study require that their use is done in a strictly controlled manner. Therefore, these data cannot be shared through a data repository. In accordance with APA Code of Ethics 8.14, raw data will be retained by the authors for 5 years, and will be shared with professionals seeking to verify substantive claims through reanalysis upon request to the primary author.

Vincent Besch served as lead for conceptualization, data curation, formal analysis, investigation, project administration, software, visualization, and writing–original draft and contributed equally to methodology. Emmanuel Poulet and Martin Debbané supervised the conceptualization, investigation, analysis, and methodology, reviewed writing and provided resources. Charline Magnin contributed to investigation, analysis and writing–review. Christian Greiner and Paco Prada contributed to writing–review.

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psychiatric emergency settings (Barr et al., 2020; Chang et al., 2014; Evans et al., 2017; Richard-Lepouriel et al., 2015; Tulloch et al., 2016). However, nosographies distinguish about 10 different categories of PD historically grouped into three clusters (Tyrer et al., 2015), and it is not clear whether the risk for and time-to-readmission differ between these categories. In fact, most of the studies focus on borderline PD or tend to assimilate borderline PD with PDs in general. Furthermore, the literature indicates that gender has a significant impact on both the symptomatology and the clinical presentation of individuals with PD and that men and women suffering from PD experience different behavioral, social, and medical outcomes (Grant et al., 2008; Sansone & Sansone, 2011; Schulte Holthausen & Habel, 2018). For example, 77% of men in prison were found to have a PD (Slade & Forrester, 2013) while 59% of psychiatric inpatients with a PD would be women (Björkenstam et al., 2015). Besides PDs, published findings indicate that psychiatric emergency readmission is associated with numerous factors: psychiatric and somatic comorbidities (Agnafors et al., 2019; Gili et al., 2010; Golay et al., 2019; Iacovides & Siamouli, 2008; Lewis et al., 2019), self-harming behavior (Carroll et al., 2014; Gunnell et al., 2008), substance use (Degenhardt & Hall, 2001; Puddephatt et al., 2021), interpersonal and social factors (Bentley et al., 2019; Beutel et al., 2017; Donisi et al., 2016; Dube & Rishi, 2017; Lakey & Orehek, 2011; Mushtaq, 2014; Pernice-Duca, 2010; Rajani et al., 2016; Schmutte et al., 2010; Scott et al., 2014; Wang et al., 2018; Wilhelm et al., 2004), and precipitating factors (Gårdvik et al., 2021; James, 2016; Kaplan et al., 2012; Reiland & Clark, 2017; Wamser-Nanney et al., 2018). The literature usually only examines one or two factors at a time, making findings heterogeneous and poorly consistent (Donisi et al., 2016).

In this context, the aim of this study is to examine whether and how readmission and time-to-readmission to psychiatric emergency vary by category of PD and gender while considering other individual, interpersonal/social, or precipitating factors known to be associated with this risk.

Based on published findings, it was hypothesized that the risk for readmission would be higher for women and young adults compared to men and middle-aged adults (Clements et al., 2006; Gunnell et al., 2008; Polling et al., 2021; Tulloch et al., 2016). Considering PD categories as per ICD, it was hypothesized that anxious-avoidant, dependent, and anankastic categories would be associated with more readmission than the impulsive, histrionic, and dissocial ones, while schizoid and paranoid with less readmissions (Fok et al., 2019). Borderline PD was expected to be both the most prevalent and with the highest risk for readmission (Lewis et al., 2019). Concerning time-to-readmission, it was expected that the male gender would be associated with a decrease in time-to-readmission although in the proportion that might not be statistically significant (Evans et al., 2017; Olfson et al., 2013; Tulloch et al., 2016). Psychiatric and somatic comorbidities were expected to increase the risk of readmission (Fok et al., 2019; Gunnell et al., 2008; Rosca et al., 2006), together with self-harming behavior (Flynn et al., 2020; Gunnell et al., 2008; Olfson et al., 2013; Perlman et al., 2015) and substance use, especially alcohol (Chang et al., 2014; Kaplan et al., 2012; Morel et al., 2020). Interpersonal and social factors were expected to be related to a higher risk of readmission (Donisi et al., 2016; Evans et al., 2017; Rosca et al., 2006).

This study uses data collected during patients hospitalizations. Following the French regulation "Code de la santé publique—article L1121-1," patients have been informed that their data will be used for medical research purposes, in a strictly controlled manner, and in compliance with the French General Data Protection Regulation (RGPD) and Data Protection Act (LIL). Patients were informed about their rights regarding their data. Patients who objected to the use of their data were not included in the study.

Materials and Method

Study Population

This study draws from the medical records of individuals with a diagnosis of PD who were admitted or readmitted from January 1, 2015 to December 31, 2020 at the "Unité Psychiatrique de Crise" (UPC), a specialized psychiatric crisis unit located within the main Lyon university hospital, and covering the greater Lyon catchment area of 1,600,000 people. Patients admitted at UPC require urgent psychiatric inpatient care. They are referred by the psychiatric emergency departments of the other hospitals of the catchment area, by the primary health care system, by mobile emergency teams, or present themselves spontaneously. There are four criteria for admission at UPC: (a) acute crisis state in the context of PDs, anxiety disorders, depression, or substance-use disorders; (b) suicidal crisis; (c) post-traumatic crisis; (d) emerging psychotic spectrum disorders only in individuals under 25 years of age. Therefore, this includes patients in crisis with known PDs as well as first-time admitted patients without a previous psychiatric diagnosis. In both undiagnosed and previously diagnosed cases, the diagnosis is established, respectively confirmed at the end of the hospitalization by the specialized medical team by Mini 5.0 or SCID-2, similarly to other practices in different countries (Bach et al., 2015; Buer Christensen et al., 2018). As this study covers all categories of PD, all hospitalization records of UPC patients with a PD diagnosis were included. Individuals with a known diagnosis of bipolar, psychotic, and autism spectrum disorders are not admitted to UPC but are referred to specialized institutions. Other exclusion criteria for admission at UPC relate to the presence of severe delusion symptoms, to high impulsivity with repetition of auto- or hetero-aggressivity, to manic state, and to the inability to give clear consent for hospitalization. The intended length of stay at UPC is 4 days, and the purpose of the intervention is threefold: (a) Secure and stabilize the patient, (b) Evaluate clinical state and potential diagnosis(es), (c) Refer him/her to the further appropriate inpatient or outpatient treatment.

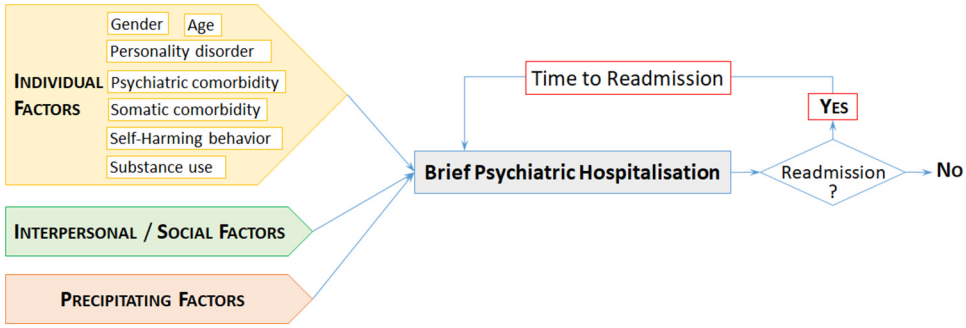
Variables

In addition to gender, age and PDs, other individual, interpersonal/social, and precipitating factors assumed to be associated with readmission were collected from the ICD codes of the patients' hospitalization records as independent variables. The outcome variables of brief psychiatric hospitalization, namely readmission and time-to-readmission, were calculated independently of the ICD codes (Figure 1).

Hospitalization records provided the following data: patient permanent identification code, gender, birth date, entry date, discharge date, the destination of discharge, ICD codes of the diagnosed disorder(s) and up to 20 additional ICD codes. The additional ICD codes are used by trained psychiatrists who assess patients to describe their

Figure 1

ICD-Based Factors (Left) Assumed to be Associated With Readmission and Time-to-Readmission



Note. See the online article for the color version of this figure. ICD = International Classification of Diseases.

condition in terms of somatic and mental health but also in terms of private and social situations, and recent negative life events.

Factors were managed as categorical variables, that is, for a given patient, each factor may possibly be valued among a defined list of categories (see Table 1 for a summary of factors and categories). A simple example is the factor "PD" which may be valued with one or several of the categories of PD. ICD codes from hospitalization records served to populate categories, for example, categories of PD were directly populated from ICD codes F60.x. Categories of psychiatric comorbidity were matched with sub-sections of ICD chapter V (e.g., all F40.xx and F41.xx codes were grouped under the category "anxiety/phobia") with an exception of F1x.x codes related to substance use because "substance use" was managed as an independent factor. Categories of the factor "somatic comorbidity" were matched with ICD chapters related to somatic diseases (Fok et al., 2019), etc. (see Supplemental Material 1 for correspondence rules, and details from all ICD-codes collected to categories and factors). When a patient record reported several ICD codes for the same category, those codes were grouped into this category. For example, a patient record indicated codes F10.01, F10.21, F10.240, F10.30, F14.05, F17.22, and F17.25, which respectively correspond to several categories of substance use: F10.xx to alcohol, F14.05 to cocaine, and F17.2x to tobacco. Thus, for this patient, the factor "substance use" was valued with the three categories "alcohol," "tobacco," and "other substance." Then, numerical variables were calculated to indicate how many categories were present for each factor. For the patient in the above example, the numerical variable for the factor "Substance use" was equal to 3. These numerical variables are meant to weigh the severity of the factors and are useful to perform multiple logistic regressions.

Readmission was measured by searching for patients with multiple hospitalization records based on their permanent identification code. These patients were identified with a binary variable "readmission" set at 1, and the time-to-readmission was calculated as the time elapsed between the discharge date of one hospitalization and the entry date of the successive one.

Table 1

Number of Individuals in Sub-Groups by Factors and Categories, and Prevalence Observed in the Study Sample

Factors/categories	*n*	Preval.	Factors/categories	*n*	Preval.	Factors/categories	*n*	Preval.
Personality disorder	**2,634**	**100.0%**	**Psychiatric comorbidity**	**2,172**	**82.5%**	**Somatic comorbidity**	**1,037**	**39.4%**
Anankastic	282	10.7%	Anxiety/phobia	416	15.8%	Articul., muscul., skeleton	65	2.5%
Anxious-avoidant	102	3.9%	Autism	2	0.1%	Blood and immunity	37	1.4%
Borderline	817	31.0%	Bipolar	102	3.9%	Circulatory	112	4.3%
Dependent	234	8.9%	Conduct disorder	197	7.5%	Digestive	58	2.2%
Dissocial	92	3.5%	Depression	1,457	55.3%	Ear	15	0.5%
Histrionic	354	13.4%	Developmental	11	0.4%	Endo., nutri., metabolism	553	20.9%
Impulsive	481	18.3%	Dissociative	28	1.1%	Eye	13	0.5%
Other/unspecified	161	6.1%	Eating	181	6.9%	Factors motivating care	336	12.8%
Paranoid	102	3.9%	Neurodegenerative	16	0.6%	Genito-urinary	51	1.9%
Schizoid	77	2.9%	OCD	52	2.0%	Infectious parasitary	42	1.6%
Interpersonal/social factors	**603**	**22.9%**	Other	35	1.3%	Injury	117	4.4%
Family difficulties	264	10.0%	Psychotic	82	3.1%	Neoplasms	11	0.4%
Loneliness	148	5.6%	PTSD	273	10.4%	Nervous system	105	4.0%
Precarity	175	6.6%	Somatoform	49	1.9%	Not classified	212	8.0%
Professional diffic.	80	3.0%	**Substance use**	**897**	**34.1%**	Respiratory	103	3.9%
Social difficulties	154	5.8%	Alcohol	594	22.6%	Skin	21	0.8%
Precipitating factors	**321**	**12.2%**	Other substance	467	17.7%	**Self-harming behavior**	**1,012**	**38.4%**
Aggression	149	5.7%	Tobacco	405	15.4%	Self-injury	267	10.1%
Other negative life event	195	7.4%	Withdrawal	287	10.9%	Self-poisoning	786	29.8%

Note. Note that *n*'s by categories do not add to *n*'s by factors due to comorbidity within factors. Factors in bold.

Statistical Analysis

Three steps of analyses were planned: (a) description of the sample; (b) analyses of the risk for readmission; and (c) analyses of the time to readmission. First, it was aimed to describe the sample by the following characteristics: distribution of patients per number of admissions; distribution of admissions and readmission rate as a function of age and gender; and prevalence of factors and categories. The second step of analyses aimed to investigate if and how readmission varied with factors and categories. χ^2 tests were planned to identify which factors, respectively categories, would be associated with readmission. Odds ratios (ORs) at 95% confidence intervals were planned to quantify how factors and categories would be associated with readmission. Multiple logistic regressions were planned to model how factors, respectively categories, would combine to influence the risk of readmission. The third step of analyses aimed to focus on the time-to-readmission. It was planned to display the distribution of the number of readmissions according to the time-to-readmission, and to check if this distribution varied with gender. Non-parametric Median and Kruskal–Wallis tests were planned to examine whether the time-to-readmission varied by gender, PD categories, and factors. Survival regressions were planned to model associations between factors, respectively categories, and time-to-readmission: a Cox regression to identify factors possibly associated with time-to-readmission, then a Kaplan–Meier regression to assess the effect of gender on the time-to-readmission.

Considering the seven factors mentioned above plus gender and age, and assuming an effect size of 0.01 for each (Rosca et al., 2006), a statistical power of 80% at a probability level of 0.05 requires a sample size of 1,566 patients. For the previous research (Lewis et al., 2019), time-to-readmission may last 4–5 years. We thus retrospectively sampled patients with PDs admitted at UPC over a 6-year period (actual sample 2,634).

Descriptive and statistical analysis employed Excel and SPSS 25.

Results

Description of the Study Sample

The selection of all patients with diagnosis of PD admitted at UPC from January 1, 2015 to December 31, 2020 provided 3,289 hospitalization records. Due to patients with multiple admissions, those 3,289 records corresponded to 2,634 individuals, among whom 2,209 were admitted once and 425 several times, which gives a readmission rate of 16.1%. The distribution of the number of patients according to their number of admissions and per gender is displayed in Figure 2. The sex ratio observed in the study sample was 2 women for 1 man (1,770 for 864).

Figure 3 gives the number of admissions and readmission rate by age range, for women and men. It shows that the readmission rate is higher for women and that, over the course of lifetime, it decreases for women and peaks around 40 for men.

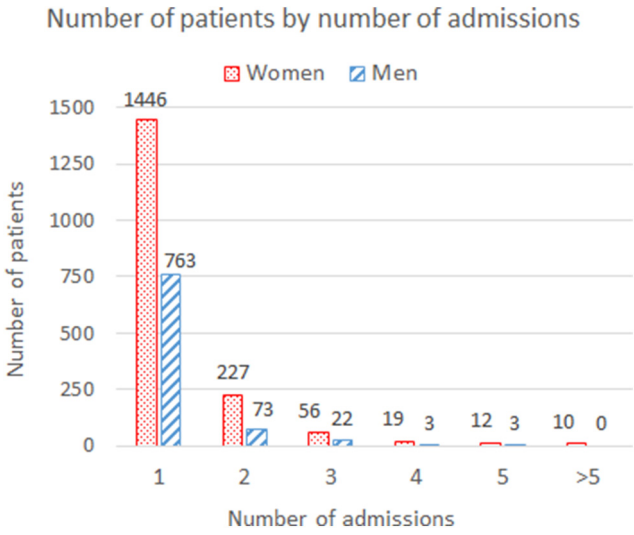
Table 1 summarizes the factors and categories observed in the study sample, and indicates the size and prevalence for each sub-group.

Factors and Categories Associated With Readmission

Readmission rates are compared between sub-groups of patients presenting or not each factor, and OR is calculated. Results (Table 2) indicate that only gender was significantly associated with readmission: while women showed a readmission rate of 18.3%, men's readmission rate was 11.7% ($\chi^2[1, N = 2{,}634] = 18.78$, $p < .001$, *OR* 1.69, 95% CI [1.33–2.15]).

Figure 2

Distribution of Patients by Number of Admissions During the 6-Year Study Period, Per Gender



Note. See the online article for the color version of this figure.

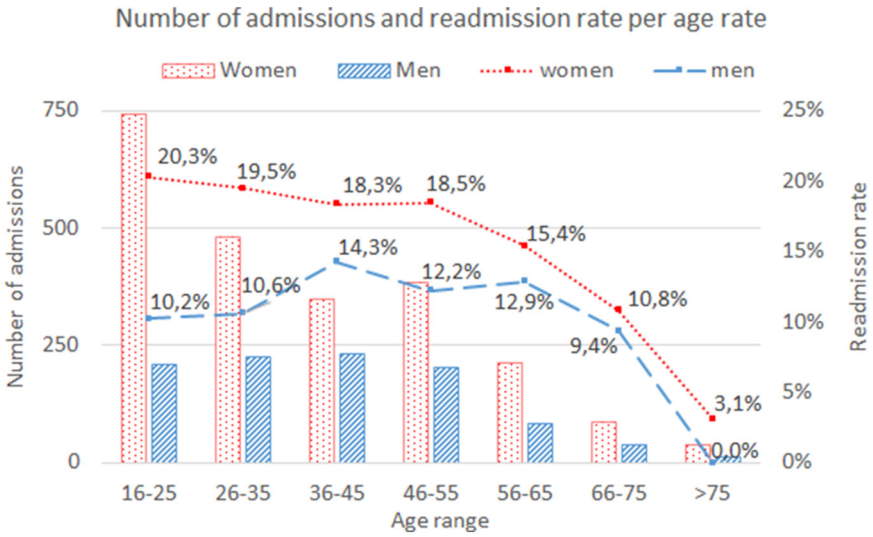
Considering PDs, χ^2 test support that the readmission rate depends on the PD category ($\chi^2[9, n = 2{,}634] = 35.12$, $p < .001$), as shown in Figure 4.

Controlling for gender (Table 3), it appears that, for women, borderline PD is associated with more readmission ($\chi^2[1, n = 1{,}770] = 10.442$, $p = .001$, *OR* 1.49, 95% CI [1.17–1.90]) while other/unspecified PDs are associated with less readmission ($\chi^2[1, n = 1{,}770] = 5.674$, $p = .017$, OR 0.40, [0.18–0.87]). For men, readmission is independent of the category of PD.

Concerning categories of psychiatric comorbidity (see Table R1 in the online supplemental material 2), for women somatoform disorders are associated with more readmission ($\chi^2[1, n = 1{,}770] = 9.208$, $p = .002$, *OR* 2.84, 95% CI [1.41–5.73]), while for men no association was found. Concerning categories of somatic comorbidity (Table R2 in the supplemental material 2), for women, circulatory disorders are associated with less readmission ($\chi^2[1, n = 1{,}770] = 4.991$, $p = .025$, *OR* 0.39, [0.17–0.92]). Concerning substance use (Table R3 in the online supplemental material 2), for women, alcohol is associated with more readmission ($\chi^2[1, n = 1{,}770] = 6.2$, $p = .013$, *OR* 1.44, [1.08–1.91]). In contrast, among men, none of the categories of substance use yield a significant correlation with readmission. Concerning self-harming behaviors, they appear independent of readmission both for women and men (Table R4 in the online supplemental material 2). Lastly, none of the categories of interpersonal/social and precipitating factors as assessed in this study were found to be associated with readmission, either for women or for men (Tables R5 and R6 in the online supplemental material 2).

Figure 3

Number of Admissions (Left Scale) and Readmission Rate (Right Scale) by Age Range, for Women and Men



Note. See the online article for the color version of this figure.

Logistic Regressions for Readmission

Multiple logistic regression was performed on the factors age, gender, PD, psychiatric comorbidity, somatic comorbidity, substance use, self-harming behavior, interpersonal/social and precipitating factors to investigate their contributions to the risk for readmission. Assumptions for multiple logistic regression were checked and met, namely the independence of errors, the absence of multicollinearity, and the absence of significant outliers (Stoltzfus, 2011; Tabachnick et al., 2019). Factors were entered stepwise forward and removed by the conditional method. After three iterations, the model obtained is significant ($\chi^2 = 31.913$, df=3, $p < .001$; Hosmer et al., 2013), and its values are consistent with the observed values ($\chi^2 = 11.174$, $df = 8$, $p = .192$). The parameters defining this model (Table 4) indicate that age (*OR* 0.993, 95% CI [0.986–1.000]) and somatic comorbidity (*OR* 0.881, [0.793–0.980]) are associated with less readmission, while female gender with an increase in readmission (*OR* 1.686, [1.325–2.145]). Other variables are not significant.

The initial and final Log-Likelihood of the logistic regression are respectively equal to 2,327.95 and 2,296.04, which gives a value of the pseudo-R^2 of 0.014, that is, an estimate of the variance of the risk of readmission explained by this model of 1.4%. The Area Under the Receiver Operating Characteristic (AUROC) is equal to 0.574, indicating that this model is significant with low discriminatory power. This is consistent with previous studies underlining a large number of factors to be taken into account to model the risk of psychiatric readmission, their low individual significance, and the modest strength to expect from multiple logistic regressions (Perlman et al., 2015; Tulloch et al., 2016).

Multiple logistic regression was performed on the sub-group of women on categories. After five runs, the model obtained is significant ($\chi^2 = 40.709$, $df = 5$, $p < .001$; Hosmer et al., 2013), and its values are consistent with the observed values ($\chi^2 = 2.002$, $df = 4$, $p = .735$). The parameters defining this model (Table 5) indicate that borderline PD (*OR* 1.776, 95% CI [1.34–2.35]), impulsive PD (*OR* 1.738, [1.25–2.41]), alcohol use (*OR* 1.345, [1.00–1.80]), and

Table 2

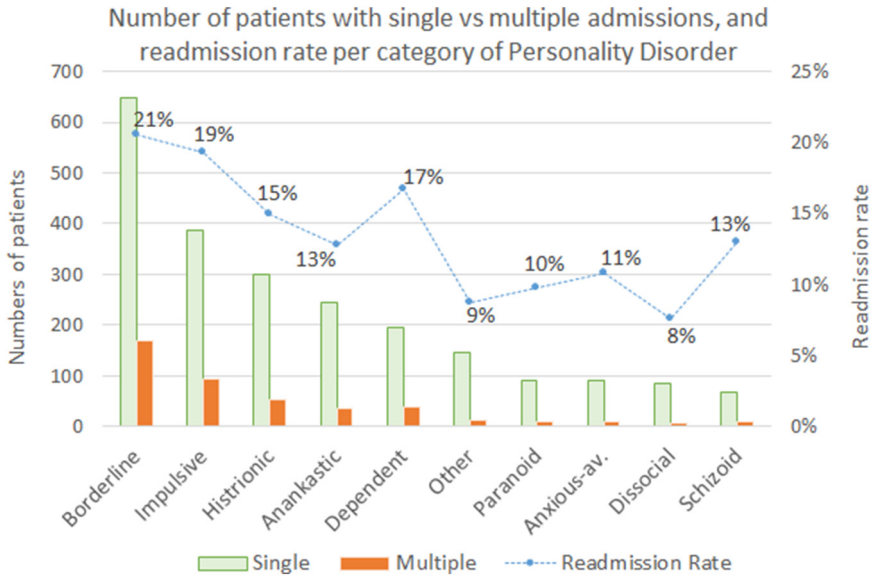
Readmission Rate Compared Between Sub-Groups With and Without Factors for Gender (Women Vs. Men), Psychiatric Comorbidity, Somatic Comorbidity, Substance Use, Self-Harming Behavior, Interpersonal/Social Factors, Precipitating Factors

Factor (*n*)	Rate with factor	Rate w/o factor	χ^2	$p\ \chi^2$	*OR*	95% CI
Gender women (1,770) **versus men**	**18.3%**	**11.7%**	**18.78**	**0.000**	**1.69**	**[1.33–2.15]**
Psychiatric comorbidity (2,172)	16.2%	15.8%	0.046	0.830	1.03	[0.78–1.36
Somatic comorbidity (1,037)	15.2%	16.7%	1.021	0.312	0.89	[0.72–1.11
Substance use (897)	17.4%	15.5%	1.586	0.208	1.15	[0.93–1.43]
Self-harming behavior (1,012)	16.1%	16.2%	0.001	0.975	1.00	[0.81–1.23]
Interpersonal/social factors (603)	15.8%	16.2%	0.084	0.772	0.96	[0.75–1.24]
Precipitating factors (321)	17.1%	16.0%	0.269	0.604	1.09	[0.80–1.48]

Note. Significant differences in bold.

Figure 4

Number of Patients With Single Versus Multiple Admissions Per PD Category, and Readmission Rate



Note. See the online article for the color version of this figure. PD = personality disorder.

somatoform disorders (*OR* 3.781, [1.84–7.78]) are associated with increased risk of readmission.

The initial and final Log-Likelihood of the logistic regression calculation are respectively equal to 1,685.00 and 1,644.29, which gives a value of the pseudo-R^2 of 0.025, that is, an estimate of the variance of the risk of readmission explained by this model of 2.5%. The AUROC is equal to 0.599 indicating that this model is significant with low discriminatory power.

For men, logistic regression calculations on categories stopped after five iterations with no significant model ($\chi^2 = 2.624$, $df = 1$, $p = .105$). This is consistent with the above χ^2 and OR results suggesting that for men, categories as measured in this study are not associated with risk for readmission.

Table 3

Readmission Rate Compared Between Sub-Groups With and Without PD Categories, for Women and Men

PD category (*n*)	Rate with PD category	Rate w/o PD category	χ^2	$p\ \chi^2$	*OR*	95% CI
Women (*n* = 1,770)						
Anankastic (113)	13.3%	18.6%	2.043	0.153	0.67	[0.38–1.17]
Anxious-av. (61)	11.3%	18.65%	2.114	0.146	0.56	[0.25–1.24]
Borderline (657)	**22.1%**	**16.0%**	10.442	**0.001**	**1.49**	**[1.17–1.90]**
Dependent (160)	17.2%	18.4%	0.164	0.686	0.91	[0.60–1.39]
Dissocial (10)	0.0%	18.4%	2.253	0.520	NA	NA
Histrionic (296)	15.6%	18.9%	1.770	0.183	0.80	[0.57–1.11]
Impulsive (351)	21.7%	17.5%	3.280	0.070	1.30	[0.98–1.74]
Paranoid (30)	13.3%	18.4%	0.504	0.478	0.68	[0.24–1.97]
Other/unspecified (65)	**8.4%**	**18.8%**	5.674	**0.017**	**0.40**	**[0.18–0.87]**
Schizoid (27)	25.0%	18.2%	0.853	0.356	1.50	[0.63–3.56]
Men (*n* = 864)						
Anankastic (169)	12.4%	11.5%	0.110	0.740	1.09	[0.65–1.82]
Anxious-av. (37)	10.0%	11.8%	0.116	0.733	0.83	[0.29–2.39]
Borderline (152)	13.7%	11.3%	0.746	0.388	1.25	[0.75–2.11]
Dependent (63)	15.4%	11.4%	0.929	0.335	1.41	[0.70–2.87]
Dissocial (80)	8.5%	12.0%	0.873	0.350	0.68	[0.31–1.53]
Histrionic (46)	10.6%	11.8%	0.053	0.820	0.89	[0.35–2.32]
Impulsive (129)	13.1%	11.4%	0.285	0.590	1.16	[0.67–2.03]
Paranoid (72)	8.3%	12.0%	0.857	0.355	0.67	[0.28–1.58]
Other/unspecified (68)	9.0%	12.0%	0.612	0.434	0.73	[0.32–1.62]
Schizoid (48)	6.1%	12.0%	1.560	0.212	0.48	[0.15–1.56]

Note. PD = personality disorder. Significant differences in bold.

Table 4
Parameters of the Factors in the Logistic Regression for Readmission

Factor	β	*SE*	Wald	*df*	Sig.	Exp(β) *OR*	95% CI
Age	**−0.007**	**0.004**	**4.355**	**1**	**0.037**	**0.993**	**[0.986–1.000]**
Gender	**0.522**	**0.123**	**18.082**	**1**	**0.000**	**1.686**	**[1.325–2.145]**
Personality disorder	2.519	—	—	1	0.113	—	—
Psychiatric comorbidity	0.026	—	—	1	0.872	—	—
Somatic comorbidity	**−0.126**	**0.054**	**5.462**	**1**	**0.019**	**0.881**	**[0.793–0.980]**
Substance use	2.078	—	—	1	0.149	—	—
Self-harming behavior	0.000	—	—	1	0.997	—	—
Interpersonal/social factors	0.247	—	—	1	0.619	—	—
Precipitating factors	0.025	—	—	1	0.873	—	—
Constant	−2.179	0.261	69.360	1	0.000	0.113	—

Note. Significant differences in bold.

Time-to-Readmission and Association With Factors and PD Categories

Among the 3,289 admissions of patients with PD at the UPC in the study period, 2,289 were discharged home and 1,000 (30.4%) were transferred to another hospital unit. Patients who were transferred to another hospital unit were excluded from the following analyses. The reason for this is that their final hospital discharge dates were not available, which made it impossible to accurately calculate their time-to-readmission. The sample of patients discharged to the home included 1,819 patients, out of which 305 with multiple admissions. Transfer to the hospital was independent of the readmission rate (14.7% vs. 16.8%, $\chi^2 = 1.737$, df=1, $p = .188$). In terms of gender, both groups were comparable (women ratio 67.9% vs. 65.5%, $\chi^2 = 1.505$, $df = 1$,], $p = .22$), as well as regarding the prevalence of factors and categories, with a diagnosis of depression being the main characteristic associated with a transfer to another hospital unit (Table R8 in the online supplemental materials).

The distribution of readmission according to the time-to-readmission, in number and cumulative percentage, is displayed in Figure 5. Since this distribution is not normal, we considered the median time-to-readmission and not the mean (Howell, 2010). As shown in Figure 5, the median time-to-readmission is 110 days, and 99.5% of readmissions occur within a 4-year horizon.

Controlling for gender, the speed of readmission (Figure S1 in the online supplemental material 2) is different between men and women (Kruskal–Wallis test, $H(1)$=4.574, $p = .032$). Indeed, as displayed in Figure 6, the median time-to-readmission for men is 46 days while for women it is 125 days (median test $p = .049$).

As suggested by Figure 7, PD categories are associated with differences in time-to-readmission, which is supported by a Kruskal–Wallis test ($H[9] = 19.90$, $p = .019$).

Median time-to-readmission are compared between sub-groups of patients presenting or not each factor, and median tests are performed (Table 6). Results suggest that the presence of psychiatric comorbidity is associated with a decrease in the median time-to-readmission from 170.5 to 93 days ($p = .042$). In contrast, the presence of self-harming behavior is associated with an increase of the median time-to-readmission from 78.5 to 146 days ($p = .03$). Time-to-readmission appears independent of somatic comorbidity, interpersonal/social and precipitating factors.

Survival Analyses on Time-to-Readmission

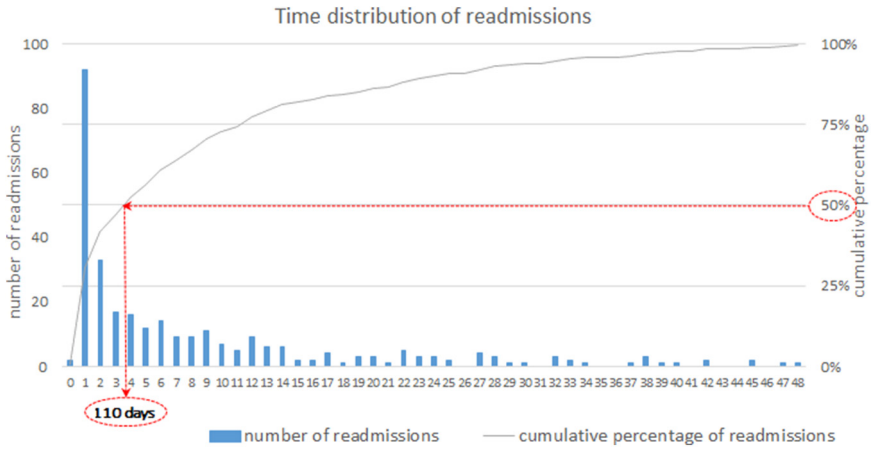
A Cox survival regression, which does not assume a normal distribution (Bewick et al., 2004), is performed on age, gender, psychiatric comorbidity, somatic comorbidity, substance use, self-harming behavior, and interpersonal/social and precipitating factors. The model obtained ($\chi^2 = 3.995$, $df = 1$, $p = .046$) supports that gender is the only factor associated with time-to-readmission ($\beta = -0.268$, Wald = 3.971, $p = .046$). This corresponds to a proportional risk ratio for women compared with men of 0.765 (95% CI [0.588–0.996]), suggesting that for each day after hospital discharge, the proportional risk of readmission is 30.7% higher for men than for women. A Kaplan–Meier logistic regression is performed to model survival probability according to gender. The model obtained is significant (Mantel–Cox Log-Rank $\chi^2 = 4.027$, $df = 1$, $p = .045$), and suggests that, during the 3 years following discharge, the risk of readmission displays a quadratic trend for men while it is more linear

Table 5
Parameters of Significant Categories in the Logistic Regression in the Sub-Group of Women (Non-Significant Categories are Given in Table R7 in the online supplemental materials)

Category	β	*SE*	Wald	*df*	Sig.	Exp(β) *OR*	95% CI
Borderline personality disorder	0.574	0.142	16.271	1	0.000	1.776	[1.34–2.35]
Impulsive personality disorder	0.553	0.168	10.879	1	0.001	1.738	[1.25–2.41]
Alcohol use	0.296	0.149	3.947	1	0.047	1.345	[1.00–1.80]
Somatoform disorders	1.330	0.368	13.033	1	0.000	3.781	[1.84–7.78]
Circulatory	−0.958	0.441	4.725	1	0.030	0.384	[0.16–0.91]
Constant	−1.916	0.111	298.346	1	0.000	0.147	—

Figure 5

Distribution of Readmissions According to Time-to-Readmission, in Number and Cumulative Percentage



Note. See the online article for the color version of this figure.

for women (Figure 8), which is consistent with earlier readmission for men shown in Figure 6.

Figure 9 shows that the survival probability curves for women and men have horizontal asymptotes, which is consistent with the risk of readmission tending toward 0 at 1,460 days (4 years) after discharge.

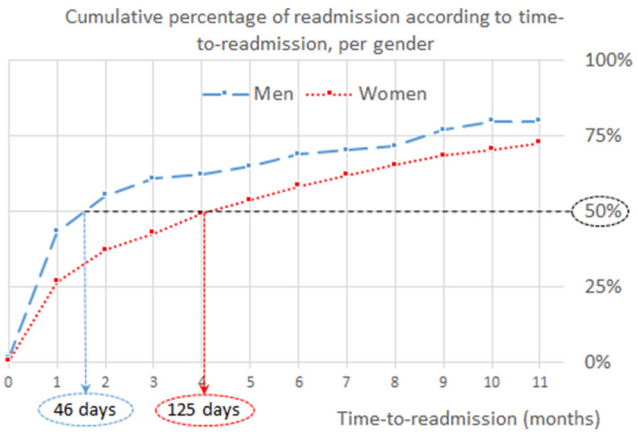
Table 7 gives the time distribution of patients readmitted according to the Kaplan–Meier model. It indicates that after 365 days, in the subsample of readmitted patients only, 84% of the men were readmitted while only 75% of the women were. This is consistent with men's faster readmission observed, and higher proportional risk found from Cox regression.

Discussion

The aim of this study was to examine whether and how PD categories, as well as individual, interpersonal/social and precipitating factors may in part explain the readmission rate in psychiatric emergency care and the quickness of time-to-readmission. We observed a 16.1% readmission rate, with women more likely to be readmitted in comparison with men. Indeed, the female gender was the strongest factor associated with readmission with an OR of 1.69. When controlling for gender, readmission was independent of PDs categories for men, while among women, the borderline category was associated with increased readmissions. Psychiatric and somatic comorbidities show only a few significant associations with readmission, which were also gender-dependent. Substance use, especially alcohol, was associated with a higher risk of readmission for women, but not for men. Concerning time-to-readmission, gender was found to be the first factor to consider with a median time-to-readmission of 46 days for men against 125 days for women. Categories of PD yielded different time-to-readmission, with Anankastic, Dependent, and Schizoid categories being associated with a median time-to-readmission as short as 29–48 days,

Figure 6

Cumulative Percentage of Readmission According to Time-to-Readmission, for Men and Women



Note. See the online article for the color version of this figure.

Figure 7

Median Time-to-Readmission Per Category of Personality Disorder

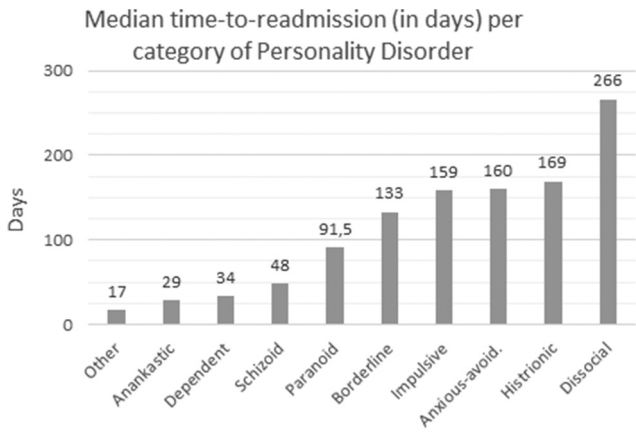


Table 6

Comparison of Median Time-to-Readmission Between Sub-Groups of Patients Without and With Factors: Women (Vs. Men), Psychiatric Comorbidity, Somatic Comorbidity, Substance Use, Self-Harming Behavior, Interpersonal/Social Factors, and Precipitating Factors

Factors (*n*)	Median time w/o factor (days)	Median time with factor (days)	*p* median test
Gender: women (231) **versus men**	**46.5**	**125**	**.049**
Psychiatric comorbidity (255)	**170.5**	**93**	**.042**
Somatic comorbidity (115)	128	80	.108
Substance use (103)	79	165	.083
Self-harming behavior (115)	**78.5**	**146**	**.03**
Interpersonal/social factors (67)	112.5	103	.806
Precipitating factors (40)	105	128	.595

Note. Significant differences in bold.

while this time is between 159 and 169 for impulsive, anxious-avoidant, and histrionic categories. Psychiatric comorbidity was associated with a shorter median time-to-readmission (from 170.5 to 93 days), while self-harming behavior was associated with a longer median time-to-readmission (from 78.5 to 146 days). Lastly, both for women and men, no evidence was found to support hypotheses on the association between the interpersonal/social and precipitating factors, and the risk for and time-to-readmission. In terms of statistical modelling, the factors examined here yield significant logistic regression models of the risk of readmission, though with low power with an AUROC ranging from 0.574 to 0.599. These modest results are in line with comparable studies on the risk of psychiatric readmission, which found AUROC from 0.55 to 0.74 (Morel et al., 2020; Perlman et al., 2015; Tulloch et al., 2016). Cox survival regression supports that gender is the only factor associated with the time-to-readmission, showing a time-based proportional risk of being readmitted 30.7% higher for men in comparison with women. Kaplan–Meier survival regression suggests that both for women and men, the risk of readmission spans over 4 years, which is consistent with previous results (Lewis et al., 2019).

In our sample, the 2:1 woman-to-man ratio in admitted patients with PD diverges from previous studies suggesting that PD prevalence is balanced between men and women (Lewis et al., 2019; Winsper et al., 2020). However, studies indicate a higher incidence of PD in women in comparison with men (Newton-Howes et al., 2021; Silberschmidt et al., 2015; Volkert et al., 2018). Cultural differences may partly explain these discrepancies (Gawda, 2018; Ronningstam et al., 2018; Winsper et al., 2020); in the sociocultural context of our study, men may be less frequently diagnosed with PD than in other countries. The measured readmission rate is lower than findings from a comparable recent publication (Lewis et al., 2019). In our view, several elements contribute to the diminished readmission rate. With regard to the health-system organization, specific intensive outpatient care is offered to UPC patients in the 3–6 months following their discharge, and outpatient consultations are available for known patients consulting psychiatric emergency departments in the area in order to limit the need for hospitalization. In addition, the measurement of readmission made here may have missed patients who would have been hospitalized in other territories, a challenge which we presume would affect similar studies internationally. The finding that female gender is the main risk factor for psychiatric emergency readmission differs from the results of transdiagnostic studies which indicate that this risk is independent of gender (Chang et al., 2014; Evans et al., 2017; Perlman et al., 2015; Schmutte et al., 2010) but is consistent with the observation that, among people with PDs, women are more likely to seek help

Figure 8

Readmission Risk Function for Women (Dotted Red) and Men (Dashed Blue)

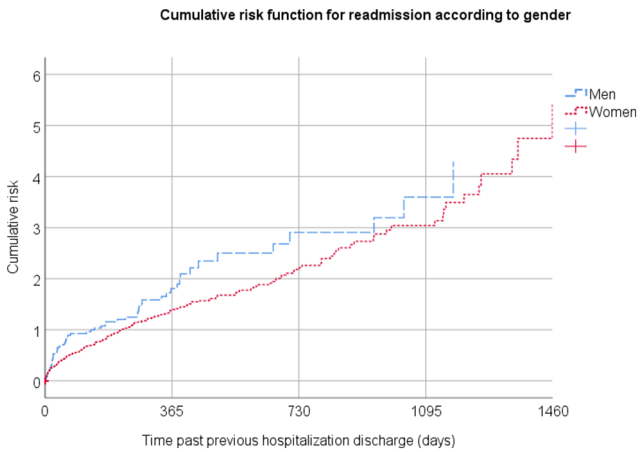


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Figure 9

Survival Probability Curves for Women (Dotted Red) and Men (Dashed Blue)

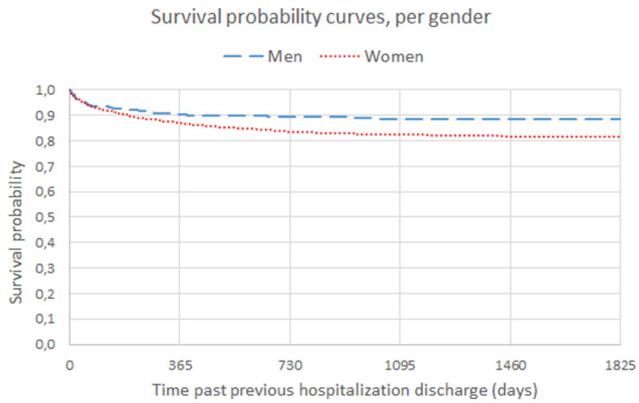

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Table 7
In the Sub-Sample of Readmitted Patients: Number and Percentage of Patients Readmitted Each Year After Hospital Discharge, for Women and Men

Days after discharge	0	365	730	1,095	1,460	1,825
Cumulative number of women readmitted over time (total 231)	0	174	206	220	230	231
Cumulative number of men readmitted (total 74)	0	62	70	72	74	74
Cumulative percentage of women readmitted	0%	75%	89%	95%	100%	100%
Cumulative percentage of men readmitted	0%	84%	95%	97%	100%	100%

than men (Tyrer et al., 2015). Among women, the higher risk of readmission associated with substance use, particularly alcohol, is consistent with previous findings (Gunnell et al., 2008; Perlman et al., 2015; Schmutte et al., 2010). This underlines the importance of a thorough assessment of substance use, followed by careful management to limit the risk of readmission to psychiatric emergencies (Chang et al., 2014). Indeed, the literature suggests that substance use is associated with both a detrimental increase in self-harming behavior and an increased risk of readmission, especially if it was not assessed as a primary diagnosis and consequently would not have been treated with sufficient consideration (Gunnell et al., 2008; Perlman et al., 2015). The increase in time-to-readmission associated with self-harming behavior should be considered in the context of the outpatient post-hospitalization suicide prevention programs developed since 2015 by UPC. Although no detailed quantitative data were available for this study, it is likely that follow-up of patients which is done through phone calls or community network may contribute to reduce the risk of readmission, and in the event of a relapse, to delay its occurrence in accordance with recent results on the benefits of post-hospitalization brief contact interventions (Milner et al., 2016; Riblet et al., 2017). Considering the differences in time-to-readmission per categories of PD, ancillary analysis indicates that those differences may be related to the association between psychiatric comorbidity and shorter time-to-readmission (Table 6). At last, our time-to-readmission analysis could be influenced by human factors which were not assessed in our research and may be of future interest when examining the clinical presentation of psychopathology and the decisions related to hospitalization.

There are a number of limitations to this study. First, it draws on an opportunistic, ecological sample of clinical data of individuals with a PD diagnosis, collected in a specialized psychiatric crisis unit. It therefore lacks the power to generalize to other contexts, and to other diagnostic profiles including psychotic, bipolar, or autistic spectrum conditions. Furthermore, even though the specialized psychiatric crisis unit at the center of this study covers a large catchment area with a stable population, this population is skewed by its main sociological parameters (western European country, large urban area), and post-hospitalization trajectories are likely impacted by the follow-up care system implemented after hospitalization at UPC. These prompt caution in generalizing the results before they are confirmed with studies in centers operating in different systems, and in different socio-cultural and geographical contexts (Gawda, 2018; Ronningstam et al., 2018; Winsper et al., 2020). As with other ecological retrospective studies, another important limitation is the loss to readmission to other territories or to other parts of the health system, which we estimate as relatively limited given that UPC is the referring psychiatric emergency unit for people with PD in the area. In terms of methodology, the frame for diagnosis is clinical, and although it is based on standardized tools (Mini 5.0 or SCID-2), a systematical thorough assessment with semistructured interview is difficult to achieve with 100% of the patients in the context of a psychiatric emergency intervention. Concerning the null results obtained on associations between readmission and interpersonal/social and precipitating factors, this may be attributable to an insufficiently systematic and exhaustive assessment of these factors. Also, our goal was to examine the explanatory power of a large scope of variables on the risk for readmission, and the results do not support this expectation. The poor results obtained may in part be attributed to the use of categorical variables, but they also indicate the limitations of logistic regression techniques for assessing the risk of readmission. In order to gain further knowledge and explanatory power on readmission and time-to-readmission, this orientates future research to employ dimensional instead of categorical measures and to use different statistical techniques such as cluster analysis or structural equations modelling (Kupek, 2006; Oladottir et al., 2022). We also suggest that it would be fruitful to investigate psychological processes such as emotion regulation or cognitive flexibility (Bryan & Rozek, 2018; Dutcher et al., 2017; Martin et al., 2017; Wolff et al., 2018), and personality traits such as impulsivity (Auerbach et al., 2017; Moeller et al., 2001) known to be involved in a mental health crisis. The identification of an individual, interpersonal and precipitating factors associated with crisis occurrence and repetition may contribute to the foster individualized treatments and more efficient care during and after the crisis period to sustain resilience (Feldman, 2020; Kalisch et al., 2015).

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