

Research paper

Suicide risk in medically ill inpatients referred to consultation-liaison psychiatric services: A multicenter study

Matteo Balestrieri^{a,*}, Paola Rucci^b, Martino Belvederi Murri^{c,d}, Rosangela Caruso^{c,d}, Armando D'Agostino^{e,i}, Silvia Ferrari^f, Maria Giulia Nanni^{c,d}, Laura Palagini^{c,g}, Stefano Pini^g, Pierluigi Politi^h, Matteo Rocchetti^h, Luigi Zerbinati^{c,d}, Luigi Grassi^{c,d}, CLPG¹

^a Psychiatric Unit, Department of Medicine, University of Udine, Udine, Italy

^b Department of Biomedical and Neuromotor Sciences, Alma Mater Studiorum, University of Bologna, Bologna, Italy

^c Institute of Psychiatry, Department of Neuroscience and Rehabilitation, University of Ferrara, Ferrara, Italy

^d University Hospital Psychiatry Unit, Integrated Department of Mental Health and Addictive Behavior, University S. Anna Hospital and Health Trust, Ferrara, Italy

^e Department of Health Sciences, University of Milan, Italy

^f Department of Diagnostic-Clinical Medicine and Public Health, Section of Psychiatry, University of Modena and Reggio Emilia, Modena, Italy

^g Department of Clinical and Experimental Medicine, Psychiatric Clinic, University of Pisa, Pisa, Italy

^h Department of Brain and Behavioral Science, University of Pavia, Pavia, Italy

¹ Department of Mental Health, ASST Santi Paolo e Carlo, Milan, Italy



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ABSTRACT

Background: The aim of this multicenter study was to investigate the suicide risk in medically ill patients admitted to six Italian hospitals for whom a consultation-liaison intervention was requested.

Methods: Participants completed socio-demographic and clinical report forms and the Brief Illness Perception Questionnaire. Suicidality was assessed using the P4 screener that investigates the presence of *Past* suicide attempts, *Plans* to commit a suicide, *Probability* of completing suicide, and *Preventive* factors. Participants were categorized as being at no, low or high suicide risk. Univariate and multivariable associations of categorical and continuous variables with suicide risk were investigated using multinomial logistic regression.

Results: Of the 641 inpatients, with mean age 60 years (SD = 16.9) and 49.2 % male, 13.2 % were at high suicidal risk (HR), 7.6 % low risk (LR) and 79.2 % no risk. Contacts with psychiatrists in the previous six months were associated with LR and HR (OR = 2.159 and 2.634, respectively), ongoing benzodiazepine use was associated with a threefold likelihood of LR (OR = 3.005), and the experienced intensity of illness symptoms was associated with LR and HR (OR = 1.257 and OR = 1.248, respectively). CL psychiatrists prescribed appropriate psychotropic drugs and activated liaison interventions and psychological support for the level of suicidal risk.

Limitations: The use of self-report measures bears the risk of recall bias.

Conclusions: Our findings based on psychiatric consultations in the general hospital underscore the need to include suicide risk in the routine assessment of inpatients referred to CL psychiatric services and to plan an appropriate management of suicidal risk after discharge.

1. Introduction

Suicide continues to be a major health problem worldwide, despite

many attempts to address risk factors and interventions in terms of both primary prevention and reducing vulnerability after a suicide attempt. Although the risk of suicide is highest in patients with psychiatric

* Corresponding author.

E-mail addresses: matteo.balestrieri@uniud.it (M. Balestrieri), paola.rucci2@unibo.it (P. Rucci), martino.belvederimurri@unife.it (M.B. Murri), rosangela.caruso@unife.it (R. Caruso), armando.dagostino@unimi.it (A. D'Agostino), silvia.ferrari@unimore.it (S. Ferrari), mariagiulia.nanni@unife.it (M.G. Nanni), stefano.pini@unipi.it (S. Pini), pierluigi.politi@unipv.it (P. Politi), matteo.rocchetti@unipv.it (M. Rocchetti), zrlgu@unife.it (L. Zerbinati), luigi.grassi@unife.it (L. Grassi).

¹ Consultation Liaison Psychiatry Group: Elisa Maso, Lucia Massa, Francesco Pardini, Alessandra Petrucci, Melissa Cherubini, Jessica Bellucci, Emilio Bergamelli, Victor Attilio Campagna, Giulia Montardi.

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disorders, particularly depression and bipolar disorders, individuals with physical diseases also present a significant suicide risk. In fact, individuals diagnosed with physical diseases have a risk of completed suicide two to three times higher than those without (Cheng et al., 2000). Cancer carries the highest suicide risk (Johnson et al., 2012; Walker et al., 2022), followed by other diseases such as hypertension, cardiovascular disease, obstructive pulmonary disease, back pain, sleep disorders, and traumatic brain injuries (Ahmedani et al., 2017; Kolva et al., 2020; Alias et al., 2021). Medical illnesses and concomitant depressive symptoms may have a synergistic effect on suicide risk, and somatic comorbidity involving several organs or systems significantly increases the risk (Qin et al., 2013; Castelpietra et al., 2015). Among elderly people, specific illnesses associated with completed suicide include congestive heart failure, chronic obstructive pulmonary disease (COPD), seizure disorder, urinary incontinence, psychiatric disorders and pain (Juurlink et al., 2004; Erlangsen et al., 2005; Fässberg et al., 2016). The most significant risk factors associated with suicidal ideation in medically ill patients are feelings of hopelessness, burdensomeness and loneliness, loss of dignity, demoralisation, loss of meaning, feeling incapable, dependent, a burden on the family, isolated and frustrated at no longer being able to take care of daily tasks (Onyeka et al., 2020; Alias et al., 2021).

In the general hospital, patients admitted to non-psychiatric wards are particularly vulnerable due to the severity of their illness. The Joint Commission confirmed that suicide is the third most frequent cause of a sentinel event in hospital in 2020, with a trend that has been steadily rising over the past fifteen years (The Joint Commission, 2022). Therefore, the Joint Commission issued Sentinel Event Alert 56 in 2016, recommending that all medical patients, including those in non-behavioural health settings, should be screened for suicide risk using standardized, evidence-based tools (The Joint Commission, 2016). Alert 56 suggested the Patient Health Questionnaire (PHQ-9) as a potentially useful tool not only as depression screener, but also for identifying suicide risk in patients with medical conditions. However, many authors have advocated the need to use agile but specific tools to identify suicide risk and analyze its different components (Roaten et al., 2018; Snyder et al., 2020; Mournet et al., 2021a).

The main objective of this multicenter study was to examine the suicide risk and its correlates in medically ill patients admitted to six Italian hospitals for whom a consultation-liaison intervention (CLI) was performed. A specific screening tool was employed to grade suicide risk by levels of severity, distinguishing ideation from planning. We also analyzed the characteristics associated with the request for CLI and its outcome.

2. Materials and methods

2.1. Subjects

This cross-sectional multi-center observational study was undertaken within the framework of a broader research plan promoted and organized by the Italian Society of Consultation Psychiatry (SIPC) aimed at analyzing the psychological and psychopathological characteristics of patients admitted to medical and surgical wards in Italy for whom a psychiatric CLI was requested (EC approval number 90/2018/Oss/UniFe). Each participant signed the informed consent in agreement with the ethical regulations of the Committee for the Protection of Persons as adopted by the Local Health Trusts, Agency Hospitals and University centers performing CL activity.

The study complied with the Declaration of Helsinki. Participants were consecutively recruited from May 2018 to November 2019 from adult inpatients (aged 18 and over) admitted to the medical and surgical wards of six Italian hospitals. Patients who were unable to answer the questionnaires for any reason (cognitive impairment, language difficulties) or to give informed consent were excluded. Information was collected on socio-demographic, clinical and organizational data.

Psychiatric diagnoses were made according to ICD-10 criteria (WHO, 1993).

2.2. Instruments

The reason for consultation was provided by the physicians in charge of the patients. Psychiatrists and the residents involved in the consultation asked participants to complete socio-demographic and clinical report forms at the end of the consultation. Information on ongoing pharmacological therapy was retrieved from clinical forms and from electronic patients' charts. Psychiatrists recorded the psychiatric clinical diagnosis and reported the psychotropic drugs prescribed.

Suicidality was assessed using the P4 screener (Dube et al., 2010). This questionnaire allows to easily rate suicide risk by asking about the “4 P's”: *Past* suicide attempts, *Plan* to commit a suicide, *Probability* of completing suicide, and *Preventive* factors. It consists of an initial screening question (“Have you had thoughts of actually hurting yourself?”) and, in case of a positive response, four subsequent independent questions. Dube et al. classified responders into four risk categories: those responding negatively to the initial screening question are classified as having “no suicide risk”; those responding positively to the screening question, but negatively to subsequent questions are at “minimal risk”; those responding positively to the questions about past suicide attempts or concrete suicide plans (*Past* or *Plan* = yes), but negatively to the subsequent questions are at “low risk”; finally, subjects who report it as likely they will make a suicide attempt in the subsequent months (*Probability* = somewhat or very likely), or who report that nothing can prevent suicidal behaviour (*Preventive* = no) are classified as “high risk”. For the purposes of our study, and as in line with Ko et al. (2021), we have reduced the original categories to three by merging the two central categories, in order to have the following classification: a) *No risk* (NR), corresponding to the original category, b) *low risk* (LR), corresponding to the two original categories of minimal and low risk, c) *high risk* (HR), corresponding to the original category.

Illness perceptions were assessed with the Italian version of Brief Illness Perception Questionnaire (BIPQ) (Broadbent et al., 2006; Pain et al., 2006; Broadbent et al., 2015). This self-report questionnaire consists of 8 items plus an unscored item listing possible causes of disease, that represent the dimensions of the construct such as: 1) Consequences: the expected effects and outcome of the illness; 2) Timeline: how long the patient believes the illness will last; 3) Personal control: the extent to which the patient believes that they can recover from or control the illness; 4) Treatment control: the extent to which the patient believes that the treatment contribute to cure the illness; 5) Identity: the intensity of the experience of symptoms of the illness; 6) Concern about the illness; 7) Understanding of the illness; 8) Emotional response to the illness: incorporates negative reactions such as fear, anger, and distress. Each item is assessed using a Likert scale from 0 to 10 and it is possible to calculate a total score from 0 to 80.

2.3. Statistical analysis

Categorical variables were summarized using absolute and percentage frequencies and ordinal and continuous variables using median and interquartile range or mean and standard deviation as appropriate. Analysis of variance and the χ^2 -test were used to compare the distribution of demographic and clinical variables among the suicide risk groups.

Univariate and multivariable associations of categorical and continuous variables with suicide risk were also investigated using multinomial logistic regression, in which results are expressed as odds ratios (and 95 % CI) of low suicide and high suicide risk compared with no risk. Variables significantly associated with suicide risk at $p < 0.05$ were entered into the multivariable model through a forward stepwise procedure.

3. Results

The study population includes 641 individuals referred to the consultation-liaison (CL) psychiatric services who completed the P4 screener. Participants were 49.2 % male and had a mean age of 60.1 years, 48.3 % were retired, 47.4 % were married, but 30.7 % were living alone, 38.1 % had contacts with psychiatrists in the previous six months, but only 14 % with community psychiatric services (Table 1). Sixty-six percent were using a psychotropic drug at the time of the consultation, mainly benzodiazepines and antidepressants.

As for the departments requiring CLI, Medicine units ranked first (39.1 %), followed by Specialty and Surgical units (28.4 % and 19.8 %), Intensive Care units (2.8 %) and other Units (9.8 %). The physical illness groups did not differ significantly in their level of suicide risk ($\chi^2 = 19.2$, $p = 0.157$) (Supplementary table). Referrals for suicide attempts accounted for 5.5 % of all referrals to CL psychiatric services. Urgent consultations were required in 18.7 % of cases.

According to P4 assessment, 13.2 % of patients had HR, 7.6 % LR and 79.2 % no risk. The wards requiring a CLI for more HR patients than LR patients were Intensive Care units (33.3 % vs. 0 %), Medicine units (12.0 % vs. 5.6 %) and Specialty units (14.9 % vs. 7.7 %). Table 2 shows that the two groups of patients with suicidal risk differed significantly in the reasons for consultation: among LR patients depression and a past psychiatric history were the most frequent and among HR patients a suicide risk assessment was the main one.

3.1. Correlates of suicide risk

The demographic and clinical characteristics of patients in the three suicide risk groups are shown in Table 1. Several characteristics differed significantly among groups, including age, marital status, working status, previous contacts with psychiatrists, ongoing drug treatment with benzodiazepines and illness perception.

Univariate analyses included in Table 3 show that age was associated with a decrease in suicidal risk (each additional year conferred a – 1.9 % risk reduction of being LR and – 2.1 % of being HR). Never being married was associated with a twofold HR as compared to being married. Moreover, being employed or unemployed were associated with an increase in LR with respect to being retired (OR = 2.466 and 2.585, respectively), while only unemployment was associated with HR (OR 2.080). Regarding clinical variables, compared to patients with NR, both LR and HR were more likely to have had contacts with a psychiatrist in the previous six months (OR = 1.382 and OR = 1.862, respectively). They were also more likely to be on benzodiazepine treatment (OR = 2.190 and OR = 1.767, respectively). The perception of illness was significantly associated with suicide risk. In particular, LR was associated with the patient's anticipation of a longer duration of illness, intensity of experienced symptoms and preoccupation with the illness, which was also associated with HR. Multinomial logistic regression performed by including all significant variables in the univariate analyses confirmed some of them (Table 3): the presence of contacts with psychiatrists in the previous six months was associated with LR and HR (OR = 2.159 and 2.634, respectively), benzodiazepine use was associated with a threefold likelihood of LR (OR = 3.005), and the intensity of illness symptoms was associated with LR and HR (OR = 1.257 and OR = 1.248, respectively).

3.2. Outcome of psychiatric consultations

Fig. 1a shows that patients with bipolar disorder had the highest suicide risk, however the difference in the distribution of LR and HR among diagnostic groups was not significant ($\chi^2 = 16.6$, $p = 0.085$). Benzodiazepines were more frequently prescribed in the presence of HR than LR ($p < 0.001$), antidepressants almost equally in the three patient groups ($p = 0.265$), antipsychotics more than twice in the two suicide risk categories than in NR ($p < 0.001$), and mood stabilizers almost

Table 1

Characteristics of the study population and distribution of suicide risk as a function of demographic and clinical variables. Significant differences are in boldface.

Variable	Risk level				test, p
	No risk (N = 509)	Low risk (N = 48)	High risk (N = 84)		
Male gender, n (%)	315 (49.2 %)	248 (48.9 %)	20 (41.7 %)	46 (55.4 %)	$\chi^2 = 2.39$, $p = 0.302$
Age, mean (SD)	60.1 (16.9)	62.3 (16.3)	55.8 (14.6)	56.0 (18.5)	ANOVA F = 7.76, p < 0.001
Marital status, n (%)					$\chi^2 = 9.69$, p = 0.046
Never married	133 (29.3 %)	92 (21.2 %)	14 (31.1 %)	27 (35.5 %)	
Separated/divorced	160 (28.7 %)	210 (48.4 %)	22 (48.9 %)	30 (39.5 %)	
Married	264 (47.4 %)	132 (30.4 %)	9 (20.0 %)	19 (25.0 %)	
Living alone, n (%)	180 (30.7 %)	146 (31.9 %)	15 (32.6 %)	19 (23.5 %)	$\chi^2 = 2.37$, $p = 0.306$
Years of education, mean (SD)	10.6 (3.9)	10.5 (4.0)	10.6 (3.7)	10.7 (3.9)	ANOVA F = 0.09, p = 0.915
Working status, n (%)					$\chi^2 = 13.0$, p = 0.011
Employed	161 (28.0 %)	122 (26.9 %)	18 (38.3 %)	21 (28.0 %)	
Unemployed	137 (23.8 %)	97 (21.4 %)	15 (31.9 %)	25 (33.3 %)	
Retired	278 (48.3 %)	234 (51.7 %)	14 (28.9 %)	29 (38.7 %)	
Contacts for mental health problems in the previous 6 months, n (%)					
Psychiatrists	230 (38.1 %)	166 (34.9 %)	21 (45.7 %)	43 (53.1 %)	$\chi^2 = 10.9$, p = 0.004
Primary care physicians	83 (14.2 %)	59 (12.7 %)	9 (20.5 %)	15 (20.0 %)	$\chi^2 = 4.13$, $p = 0.119$
Community psychiatric services	83 (14.0 %)	62 (13.2 %)	6 (13.6 %)	15 (19.2 %)	$\chi^2 = 2.01$, $p = 0.366$
Drug and substance addiction services	23 (4.2 %)	20 (4.3 %)	2 (4.5 %)	3 (3.6 %)	$\chi^2 = 0.09$, $p = 0.957$
Ongoing drug treatment, n (%)					
Any psychotropic drug	423 (66.0 %)	326 (64.0 %)	36 (75.0 %)	61 (72.6 %)	$\chi^2 = 4.24$, $p = 0.120$
Antidepressants	218 (34.1 %)	165 (32.7 %)	20 (41.7 %)	33 (39.3 %)	$\chi^2 = 2.68$, $p = 0.262$
Mood stabilizers	82 (12.8 %)	62 (12.3 %)	9 (18.8 %)	11 (13.1 %)	$\chi^2 = 1.64$, $p = 0.440$
Antipsychotics	108 (16.9 %)	82 (16.2 %)	9 (18.8 %)	17 (20.2 %)	$\chi^2 = 0.94$, $p = 0.626$
Benzodiazepines	245 (38.3 %)	177 (35.0 %)	26 (54.2 %)	41 (48.8 %)	$\chi^2 = 11.30$, p = 0.004
Illness perception, mean (SD) ^a	7.1 (2.4)	7.0 (2.3)	7.1 (3.0)	7.4 (2.6)	

(continued on next page)

Table 1 (continued)

Variable	Risk level				test, p
	No risk (N = 509)	Low risk (N = 48)	High risk (N = 84)		
BIPQ1 – Consequences of illness					ANOVA F = 0.859, p = 0.424
BIPQ2 – Timeline	6.7 (2.5)	6.9 (2.5)	7.6 (3.1)	7.1 (2.2)	ANOVA F = 5.01, p = 0.007
BIPQ3 – Personal control	5.4 (2.4)	5.4 (2.3)	5.8 (2.7)	5.3 (2.5)	ANOVA F = 0.60, p = 0.551
BIPQ4 – Treatment control	3.8 (2.1)	3.8 (2.1)	3.5 (2.6)	4.2 (2.1)	ANOVA F = 1.32, p = 0.267
BIPQ5 – Identity/ intensity of symptoms	6.8 (2.3)	6.7 (2.2)	7.5 (2.3)	7.1 (2.5)	ANOVA F = 3.51, p = 0.03
BIPQ6 – Illness concern	6.9 (2.1)	6.7 (2.2)	7.8 (2.4)	7.4 (1.9)	ANOVA F = 7.14, p < 0.001
BIPQ7 – Understanding of the illness	4.0 (2.2)	4.0 (2.2)	3.7 (2.6)	3.9 (2.3)	ANOVA F = 0.52, p = 0.597
BIPQ8 – Emotional response	7.0 (2.2)	6.9 (2.1)	7.3 (2.9)	7.4 (1.9)	ANOVA F = 2.24 p = 0.107
BIPQtot – Overall score	47.8 (10.1)	47.1 (9.7)	50.9 (12.4)	50.6 (9.9)	ANOVA F = 6.28, p = 0.002

Note. Absolute numbers may differ by variables because of missing data.
 a Scores of items BIPQ3, BIPQ4, BIPQ7 are reversed to have the same direction of the others.

Table 2

Relationship between reason for consultation and suicide risk. Overall χ^2 test = 25.5, p = 0.008. Asterisks denote reasons significantly differing between low-risk and high-risk patients.

	Low risk	High risk
Depression*	20 (41.7 %)	18 (21.4 %)
Past psychiatric history*	12 (25.0 %)	8 (9.5 %)
Agitation	5 (10.4 %)	9 (10.7 %)
Anxiety	3 (6.3 %)	6 (7.1 %)
Aggressive behaviour	2 (4.2 %)	2 (2.4 %)
Alcohol/substance use	2 (4.2 %)	3 (3.6 %)
Suicide attempt/risk*	1 (2.1 %)	28 (33.3 %)
Unexplained somatic symptoms	1 (2.1 %)	2 (2.4 %)
Legal problems	1 (2.1 %)	1 (1.2 %)
Other	1 (2.1 %)	5 (6.0 %)
Delusions/hallucinations	0	1 (1.2 %)
Insomnia	0	1 (1.2 %)

* Significant post-hoc comparisons at Bonferroni-correlated significance level.

twice in HR than in other patient groups (p = 0.003) (Fig. 1b). The most frequent CLI interventions for HR patients were liaison with psychiatric services (19 %) and involvement of the patient's family (25 %). Liaison with psychiatric services was also frequent in LR (20.8 %), together with psychological support (27.1 %). Differences between the three groups of patients were significant for liaison with the psychiatrist (p = 0.002) and family (p < 0.001) and for psychological support (p = 0.001) (Fig. 1c).

4. Discussion

Several factors contribute to suicide risk, the most important of which can be identified among patients' characteristics, while others are attributable to the missing detection of risk itself, and the lack of implementation of appropriate prevention interventions and psychological support to the patient. There are several studies on patients

hospitalized for suicide attempts (Alberdi-Sudupe et al., 2011; Cooper-Kazaz, 2013; Chen et al., 2016; Mournet et al., 2021b) and some evidence from screening for suicide in emergency departments and inpatients (Furlanetto and Stefanello, 2011; Roaten et al., 2018; Snyder et al., 2020; Thom et al., 2020), whereas to our knowledge there is only one study that reported suicide risk as a reason for requesting CLI in general hospital (Gala et al., 1999). Importantly, CLI allows analyzing the whole process, from the detection of the patient at risk of suicide by non-psychiatric physicians, to the confirmation of risk by psychiatrists and the planning of management in the ward and in the post-discharge period.

Our sample included a fair proportion of patients with mental health problems identified prior to admission, as more than one third of them had contact with psychiatrists in the previous six months, and two thirds were using a psychotropic drug at the time of consultation. As expected, urgent consultations were associated with HR.

Overall, more 20.6 % of patients had a suicide risk, and 13.1 % HR. A direct comparison of such raw prevalence rates with those of patients hospitalized for medical reasons in other studies is difficult. Furlanetto and Stefanello (2011) reported a 7.2 % prevalence of suicidal ideation in inpatients, Roaten et al. (2018) reported rates of suicidal intention or planning below 1 % in a sample including <5 % of inpatients, Snyder et al. (2018) screened 2.2 % of patients at risk of suicide in a clinical research hospital.

In our study referrals for suicide attempts accounted for 5.5 % of all referrals to psychiatric liaison services. In a previous multicenter study conducted in Italy >20 years ago this percentage had the same order of magnitude (5.9 %) (Gala et al., 1999). In the present study, the percentage of referrals for past suicide attempts in patients subsequently assessed as HR was high, confirming the association between previous attempts and risk of suicide.

Some sociodemographic variables were associated with a heightened risk of suicide. One of these is age, with a decreasing risk among older patients. This apparently contrasts with the evidence of a high suicide risk in older patients (Juurlink et al., 2004), but we must bear in mind that the average age of the sample was 60 years, which attests to the relatively lower presence of young inpatients. A systematic review reported that suicidal behaviour in the elderly was associated with functional disability and a number of specific conditions including malignant diseases, neurological disorders, pain, COPD, liver disease, male genital disorders, and arthritis/arthrosis (Fässberg et al., 2016).

Another condition associated with high suicide risk is not being married, which reflects the absence of family support (Bell et al., 2018). Finally, we found that unemployment was associated with both low and high suicide risk, while employment was only associated with low risk. These results are consistent with evidence from the literature suggesting that unemployment is a risk factor for hospitalization for mental disorders and that mental disorders significantly increase the risk of suicide (Honkonen et al., 2007; Milner et al., 2013; Castelpietra et al., 2019).

As to clinical variables, we found that both LR and HR subjects had contacts with their psychiatrist in the months prior to hospital admission, but they did not differ from NR subjects in their contact with the primary care physicians or community psychiatric services. This would indicate the need for a liaison with these health professionals to ensure adequate monitoring and support of patients at risk.

It is interesting that prior to hospitalization, individuals at risk for suicide were more likely to use benzodiazepines but not other psychotropic drugs. Because benzodiazepine use is associated with an overall increased risk of attempting or completing suicide (Dodds, 2017), it is possible that pharmacological suicide prevention prior to hospitalization was inadequate in this sample of inpatients.

Surprisingly, the risk of suicide was unrelated to the presence of adjustment disorder, which is often diagnosed to represent abnormal reactions to the presence of physical illnesses; however, it was related with specific illness perceptions. In particular, suicide risk was associated with patients' perception of longer duration of illness, greater

Table 3

OR (95 % CI) of low and high suicide risk (vs. none) as a function of demographic and clinical variables. Results of univariate and multivariable logistic regressions. Significant ORs are in boldface.

	Univariate logistic regression		Multivariable logistic regression	
	Low vs. no risk	High vs. no risk	Low vs. no risk	High vs. no risk
Male gender	0.746 (0.410–1.359)	1.298 (0.814–2.070)		
Age	0.981 (0.964–0.999)	0.979 (0.965–0.992)		
Marital status				
Never married	1.453 (0.712–2.965)	2.054 (1.156–3.650)		
Separated/divorced	0.651 (0.291–1.456)	1.008 (0.545–1.863)		
Married	Ref	ref		
Living alone	1.034 (0.541–1.975)	0.655 (0.378–1.135)		
Years of education (mean)	1.009 (0.917–1.110)	1.016 (0.941–1.096)		
Working status				
Employed	2.466 (1.186–5.127)	1.389 (0.760–2.538)		
Unemployed	2.585 (1.202–5.559)	2.080 (1.159–3.733)		
Retired	Ref	ref		
Contacts in the previous 6 months				
Psychiatrists	1.382 (0.753–2.537)	1.862 (1.162–2.985)	2.159 (1.068–4.362)	2.634 (1.487–4.666)
Primary care physicians	1.765 (0.808–3.857)	1.716 (0.916–3.217)		
Community psychiatric services	1.037 (0.421–2.553)	1.563 (0.838–2.915)		
Dependency services	1.069 (0.242–4.732)	0.842 (0.244–2.899)		
Ongoing drug use				
Any psychotropic drug	1.684 (0.855–3.317)	1.489 (0.892–2.486)		
Antidepressants	1.472 (0.805–2.690)	1.333 (0.829–2.146)		
Mood stabilizers	1.077 (0.541–2.141)	1.649 (0.762–3.568)		
Antipsychotics	1.190 (0.555–2.552)	1.309 (0.731–2.343)		
Benzodiazepines	2.190 (1.206–3.976)	1.767 (1.110–2.814)	3.005 (1.471–6.140)	1.306 (0.371–2.335)
Illness perception				
BIPQ1 – Consequences of illness	1.006 (0.888–1.139)	1.071 (0.966–1.188)		
BIPQ2 – Timeline	1.207 (1.055–1.380)	1.093 (0.990–1.208)		
BIPQ3 – Personal control	1.074 (0.936–1.232)	0.984 (0.888–1.091)		
BIPQ4 – Treatment control	0.944 (0.810–1.099)	1.080 (0.967–1.208)		
BIPQ5 – Identity/intensity of symptoms	1.194 (1.016–1.404)	1.100 (0.984–1.231)	1.257 (1.044–1.513)	1.248 (1.079–1.445)
BIPQ6 – Illness concern	1.316 (1.100–1.575)	1.167 (1.030–1.323)		
BIPQ7 – Understanding of the illness	0.932 (0.807–1.077)	0.975 (0.874–1.088)		
BIPQ8 – Emotional response	1.094 (0.936–1.278)	1.124 (0.995–1.269)		
BIPQtot – Overall score	1.042 (1.011–1.065)	1.038 (1.011–1.065)		

symptom severity and preoccupation for the illness itself. Multivariable analysis revealed that the prevalent perception for both LR and HR was the presence of troublesome symptoms. This finding confirms the literature finding of an association between perceived symptom intensity and suicide risk (Racine et al., 2017; Ashrafioun et al., 2019).

Finally, the analyses of the prescriptions by the CL psychiatrists highlight the presence of a gradient in the pharmacological indication, where mood stabilizers were more frequently prescribed to HR patients, antipsychotics equally to LR and HR subjects, and antidepressants independent of suicide risk. Moreover, benzodiazepines were mostly prescribed to subjects without suicidal risk and more frequently to HR than to LR patients. This prescribing pattern suggests the CL psychiatrist's intention to prescribe, during hospitalization, mainly drugs with a rapid onset of action. At the same time, they correctly adopted liaison strategies with psychiatric services and the family, and intervened by activating psychological support. The small frequency of liaison interventions with primary care physicians did not allow to identify significant differences among groups, even if these interventions were more common among patients at risk of suicide. Quite coherently, the CL psychiatrists considered a psychological support intervention more useful for patients with LR, while for patients with HR liaison with the family was considered a priority in order to organize support and risk monitoring within and at the outside the hospital.

This study adds to the existing knowledge on suicide risk in medically ill inpatients by showing that a careful assessment of the risk in inpatients referred to the CL psychiatric services is a reasonable, ethical and feasible initiative. A second point refers to our evidence that intensity of physical illness symptoms is associated with not only suicidal ideation, but also its planning. Suicide prevention has to start with the work that has to be done to help the patient find support by addressing illness-related concerns with appropriate strategies. Finally, the CLI we

analyzed deserves some comments. Suicide risk is well known to be particularly high in the post-discharge phase of the patient from hospital. About twice as many suicides are detected in the 72 h after hospital discharge than during hospitalization (The Joint Commission, 2022), and suicide rates are highest in the first year after discharge, remaining high in the long term (Wang et al., 2019). It is important that the CL psychiatrist makes the right decisions in terms of psychological support, pharmacological treatment and liaison with family members and psychiatric and general practitioner colleagues to safely organize patients' return to their home (Wang et al., 2019). Our study suggests that CL psychiatric services adopted adequate interventions according to the principles of continuity of care and shared service responsibility after discharge from hospital (Knesper et al., 2010; NICE, 2019; The Joint Commission, 2019), with psychotropic drugs prescriptions and provision of psychological support and liaison with primary care physicians, psychiatrists in the community, and patients' families.

Our findings should be interpreted keeping in mind some limitations. First, the use of self-report assessment may bear the risk of a recall bias and over or underestimation of symptoms and perceptions. Second, request for consultations and planned interventions might vary according to the local system organization and resources available. Because the reason for consultation was provided by the physicians in charge of the patients, some variability may be expected in relation to their background and expertise. The exclusion of patients unable to fill out the questionnaire may limit the generalization of our findings.

In conclusion, our study confirms the compelling need to include suicide risk in the routine assessment of inpatients referred to CL psychiatric services, in light of the increase in mental health disorders associated with the COVID-19 pandemic and the economic crisis related to the war. Although further research is needed to assess the medium and long-term effectiveness of tailored interventions, detection and

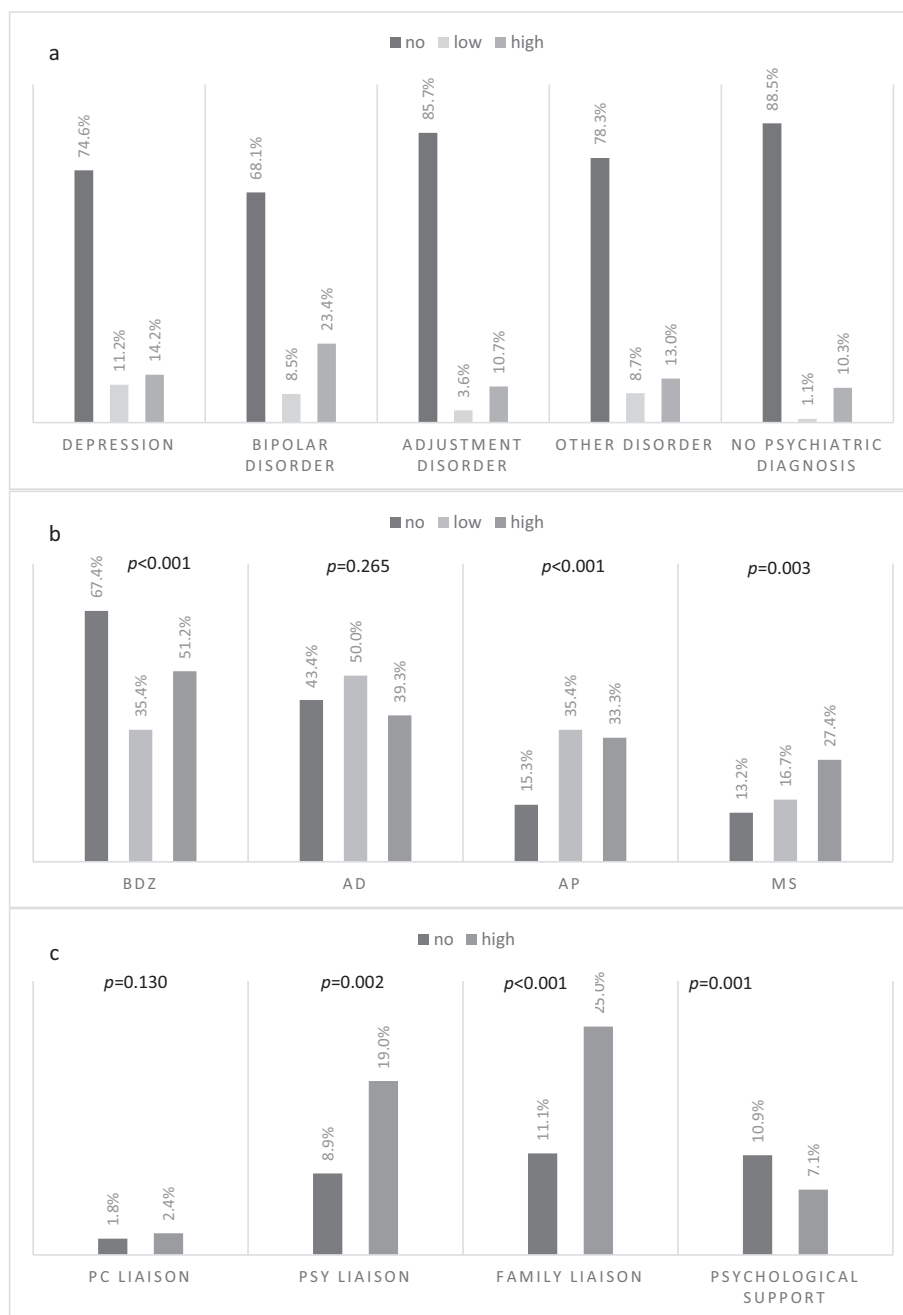


Fig. 1. Percentage distribution of psychiatric diagnoses, psychotropic drug prescriptions and type of intervention in patients seen in consultation. p-Values for χ^2 tests are reported. The suicide risk does not differ significantly among diagnostic groups ($\chi^2 = 16.6$, $p = 0.085$).

management of suicidal risk during hospitalization enhances the chances of saving lives and promotes mental health recovery.

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ORCID iD authorship contribution statement

Matteo Balestrieri collected the data and wrote the paper, Paola Rucci analyzed the data and revised the paper, Laura Palagini, Luigi

Zerbinati, Martino Belvederi Murri, Rosangela Caruso, Armando D'Agostino, Silvia Ferrari, Maria Giulia Nanni, Pierluigi Politi, Matteo Rocchetti and Stefano Pini collected the data and revised the paper, Luigi Grassi supervised the general project and revised the paper. All the authors approved the final version of the manuscript.

Conflict of interest

The authors have no conflicts of interest to declare.

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