

## Article

# Sociodemographic, Circumstantial, and Psychopathological Predictors of Involuntary Admission of Patients with Acute Psychosis

Johanna Seifert , Christian Ihlefeld , Tristan Zindler , Christian K. Eberlein , Maximilian Deest, Stefan Bleich, Sermin Toto and Catharina Meissner

Department of Psychiatry, Social Psychiatry and Psychotherapy, Hannover Medical School, 30625 Hannover, Germany; ihlefeld.christian@mh-hannover.de (C.I.); zindler.tristan@mh-hannover.de (T.Z.); eberlein.christian@mh-hannover.de (C.K.E.); deest.maximilian@mh-hannover.de (M.D.); bleich.stefan@mh-hannover.de (S.B.); toto.sermin@mh-hannover.de (S.T.); meissner.catharina@mh-hannover.de (C.M.)

\* Correspondence: seifert.johanna@mh-hannover.de

**Abstract:** Studies have consistently determined that patients with acute psychosis are more likely to be involuntarily admitted, although few studies examine specific risk factors of involuntary admission (IA) among this patient group. Data from all patients presenting in the psychiatric emergency department (PED) over a period of one year were extracted. Acute psychosis was identified using specific diagnostic criteria. Predictors of IA were determined using logistic regression analysis. Out of 2533 emergency consultations, 597 patients presented with symptoms of acute psychosis, of whom 118 were involuntarily admitted (19.8%). Involuntarily admitted patients were more likely to arrive via police escort (odds ratio (OR) 10.94) or ambulance (OR 2.95), live in a psychiatric residency/nursing home (OR 2.76), report non-adherence to medication (OR 2.39), and were less likely to suffer from (comorbid) substance abuse (OR 0.53). Use of mechanical restraint was significantly associated with IA (OR 13.31). Among psychopathological aspects, aggressiveness was related to the highest risk of IA (OR 6.18), followed by suicidal intent (OR 5.54), disorientation (OR 4.66), tangential thinking (OR 3.95), and suspiciousness (OR 2.80). Patients stating fears were less likely to be involuntarily admitted (OR 0.25). By understanding the surrounding influencing factors, patient care can be improved with the aim of reducing the use of coercion.

**Keywords:** coercion; psychiatry; psychopathology; emergency care; legal status



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## 1. Introduction

Involuntary admission (IA) of mentally ill patients is meant to deter immediate danger to the patient and/or others in an emergency situation or to provide medical treatment to patients lacking insight. As it severely restricts patients' freedom, measures for coercive hospital admission are legally regulated [1] and should only be considered as a last resort when other less restrictive measures are not feasible [2]. A recent study analyzing IA in several European countries found that in 2015 Germany had the second highest rate of IA (173 per 100,000 individuals) following Austria (283 per 100,000 individuals) [3]. Moreover, the number of IAs in Germany observed a steady increase between 2005 and 2014 [4].

In Germany, the legal basis for involuntary hospitalization of patients is either provided by the Mental Health Act (German: "Psychisch-Kranken-Gesetz", PsychKG) in cases of immediate, severe threat to themselves or to others or by guardianship orders according to federal law (German: "Bürgerliches Gesetzbuch", BGB) for patients requiring (non-immediate) treatment. A short report provided by a psychiatrist or physician with sufficient experience within the field of psychiatry (including emergency care) serves as the basis for preliminary detention of up to 24 hours before a court hearing is held within

the hospital. Each patient is provided with legal representation for court proceedings and has the right to appeal IA. A local court (German: "Amtsgericht") serves as the deciding authority in compulsory treatment [3,5].

While the use of coercive measures ideally results in a substantial clinical improvement [6] and improved psychosocial outcome [7], IA is also associated with several adverse treatment outcomes such as longer length of inpatient care [6,8,9], lower treatment satisfaction [6,10], rapid readmission [6,11], higher suicide rates [6], post-traumatic stress disorder [12], and lower level of social functioning [6]. Moreover, involuntarily admitted patients (INVOLP) are subject to shame, self-contempt, and stigmatization resulting in potentially detrimental effects on recovery [13]. Furthermore, the fear of coercive measures is associated with a patient's reluctance to seek treatment in the future [14].

Many efforts have been made to address risk factors of IA. Some frequently reported predictors of IA include male gender [15,16], immigrant status [5,16,17], lower socioeconomic status and lack of social support [2,3,15,18], admission outside of regular service hours [2,5,16,19], and previous IA [20]. Comprising between 30% and 50% of involuntarily admitted patients in Europe, one of the most commonly reported predictors of IA is schizophrenia or related psychotic conditions [2,11,15,16,20,21]. Despite the high prevalence of patients with acute psychosis among INVOLP, limited research has been dedicated specifically on their behalf [15,22–24]. The present study aims to contribute to the understanding of patients with symptoms of acute psychosis during emergency situations not only by considering the circumstances surrounding IA, but also by reflecting upon specific psychopathological features of these patients that ultimately influence their legal status.

## 2. Materials and Methods

### 2.1. Setting

Servicing a catchment area of 138,471 inhabitants, the university hospital Hannover Medical School is one of four psychiatric hospitals in Hannover and its municipal environs. It is the only department of psychiatry within the city limits of Hannover and with other medical disciplines (e.g., internal medicine, neurology) on site. Due to the better accessibility and the option of interdisciplinary medical care, many patients presenting in Hannover Medical School's psychiatric emergency department (PED) reside outside of the official catchment area and are later transferred to their designated psychiatric hospital for inpatient care. In this study, inpatient admissions include both admissions to inpatient care at Hannover Medical School, as well as transfers to the surrounding psychiatric hospitals following initial assessment in the PED of Hannover Medical School.

### 2.2. Collection of Data

Electronic documentation of all patients ( $\geq 18$  years of age) seeking emergency psychiatric care in the PED of Hannover Medical School from 1 March 2019 to 29 February 2020 was collected. An electronic document is routinely created for every patient presenting in the PED from which relevant information including basic sociodemographic and clinical characteristics as well as last treatment within the department of psychiatry of Hannover Medical School (including inpatient treatment and emergency consultation) was extracted. Primary psychiatric diagnosis was documented according to the International Classification of Disease 10th Version (ICD–10) [25], and then grouped according to major diagnostic subgroup (F0–F4 and F6). Because of the low number of cases, diagnoses not falling within these subgroups (i.e., F5 and F7–9) were classified as "others". Data were de-identified by pseudonymization.

Furthermore, 80 individual aspects of the psychopathological assessment (PPA) according to the "Arbeitsgemeinschaft für Methodik und Dokumentation in der Psychiatrie" (AMDP)-System [26], routinely documented for each patient, were assessed (see supplementary data Table S1 for a full list). The AMDP-System is a manual for standardized documentation of PPA commonly used in German-speaking countries. It consists of a

glossary of psychopathological symptom descriptions pertaining to different aspects of PPA. In this study, aspects of PPA considered highly relevant for emergency psychiatric care (e.g., orientation, formal and content thought disorders, affective disturbances, suicidality) [26] that were, therefore, expected to be reliably documented were extracted by looking for key words as predetermined by the AMDP-Manual. In cases in which hallucinations and/or delusions appeared to be present but could not be verified with certainty—for example when a patient was uncooperative—the items “evidence for delusions/hallucinations” were selected.

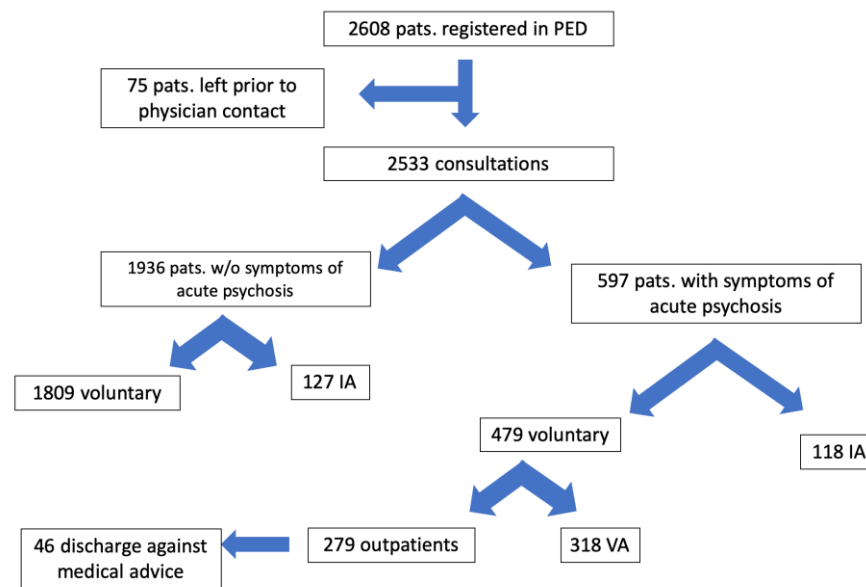
A total “PPA score” was calculated by adding all individual variables (as shown in supplementary Table S1) that applied together. The variables “any disturbance of disorientation”, “any formal thought disorder” etc. were not included in the score as these variables are derived from the individual variables within the respective category.

### 2.3. Selection of the Study Population

Due to the frequent unreliability of diagnoses made in the PED [27], primary psychiatric diagnosis receives only minimal attention in this study. Instead, this study uses aspects of PPA as documented by the psychiatrists on call to determine patients with symptoms of acute psychosis regardless of the psychiatric diagnosis according to ICD–10. This study, therefore, specifically includes all patients with symptoms of acute psychosis including those suffering from affective disorders, substance use disorders, and organic mental disorders (e.g., delirium). Despite the organic nature of delirium, patients suffering from a previously diagnosed mental disorder (mainly dementia) presenting with acute delirium are often primarily treated by the psychiatrist on call. These patients receive a full differential-diagnostic work-up prior to admission. If the cause of delirium is manageable within the psychiatric setting (e.g., urinary tract infection, mild hyponatremia), the patient is admitted to the psychiatric ward.

Acute psychosis was defined as the presence of positive symptoms when PPA included at least one of the following symptoms based on an adaptation of criteria by Gebhardt et al. [28,29]: presence or evidence of content thought disorders (i.e., delusional mood, perception, ideas, systemized delusions, delusions), hallucinations (i.e., hearing voices, other auditory hallucinations, visual hallucinations, olfactory hallucinations, bodily hallucinations), and ego disturbances (i.e., depersonalization, derealization, thought broadcasting, and thought insertion, thought withdrawal, other feelings of alien influence). Cases were then manually screened for plausibility and removed in case the above-mentioned criteria was not fulfilled.

The study population was divided into two groups based on legal status. INVOLP were always admitted to inpatient care, while the group of voluntary patients (VOLP) were either admitted to hospital or discharged directly from the PED (Figure 1). By including patients who were discharged, this study is able to assess a broader spectrum of patients and psychopathological aspects. As frequent re-presentation of psychiatric patients, especially those suffering from psychotic-related illness, is a well-described phenomenon [30], patients presenting multiple times during the observation period were included in data analysis provided that the aforementioned psychopathological criteria was met.



**Figure 1.** Composition of the study sample. pats: patients, PED: psychiatric emergency department, w/: with, w/o: without, VA: voluntary admission, IA: involuntary admission.

#### 2.4. Data Analysis

Statistical analysis was performed using the program SPSS© version 26 by IBM. The statistical significance level was set to a  $p$ -value of  $< 0.05$ . Descriptive analyses were performed to compute the characteristics of the study population using a Student's  $t$ -test (ordinal and interval scale, parametric) or chi-squared test (nominal scale, parametric). Sociodemographic variables included sex, age, (comorbid) substance use disorder, and living situation, while circumstantial characteristics included means and time of presentation, suicide attempt prior to presentation, non-adherence, inebriation, and use of mechanical restraint.

Predictors of IA were analyzed using a binary logistic regression model. Variables with  $p < 0.25$  were selected after a preceding univariate logistic regression analysis and included in a forward multivariate logistic regression model [31]. Logistic regression was performed twice: first, to identify sociodemographic and circumstantial factors associated with IA, and additionally to analyze specific variables of PPA. Only PPA aspects applying in at least 20 cases were considered. As the individual items of the categories "disturbances of orientation" and "impairment of cognition" pertain to fairly similar cognitive dysfunctions, only the variables "any disturbance of orientation" and "any impairment of cognition" were further analyzed.

#### 2.5. Ethical Approval

Ethical approval for this study was obtained from the Clinical Ethics Committee of Hannover Medical School (No. 9058\_BO\_K\_2020). This study adheres to the Declaration of Helsinki and its later amendments.

### 3. Results

Between 1 March 2019 and 29 February 2020, 2608 registrations for emergency psychiatric care were made. Excluding cases in which the patient left prior to physician contact, a total of 2533 emergency psychiatric consultations were made. In almost one fourth of cases (597; 23.6%) criteria of acute psychosis were fulfilled. Nearly one fifth (118 out of 597 patients; 19.8%) of patients with acute psychosis were involuntarily admitted. The rate of IA was relevantly lower (127 out of 1936 patients; 6.6%) among non-psychotic patients (Figure 1). A total of 414 individual patients were responsible for the 597 emergency consultations in which symptoms of acute psychosis were present.

Each individual patient presented for an average of  $1.44 \pm 1.20$  consultations (range 1–16; median 1).

### 3.1. Sociodemographic and Circumstantial Characteristics of the Study Sample

Table 1 shows the basic sociodemographic and circumstantial variables according to legal basis of treatment. More than half of patients with acute psychosis were male (57.8%), sex did not differ significantly among VOLP and INVOLP. INVOLP were older than VOLP ( $48.45 \pm 19.17$  vs.  $44.15 \pm 17.07$ ,  $p = 0.016$ ). Means of presentation differed significantly among INVOLP and VOLP with INVOLP far more likely to arrive in the PED via ambulance (49.2% vs. 30.3%,  $p < 0.001$ ) and police escort (33.9% vs. 4.8%,  $p < 0.001$ ), while VOLP most commonly arrived unaccompanied by foot (40.1% vs. 5.9%,  $p < 0.001$ ). The use of mechanical restraint was significantly higher in patients admitted involuntarily (16.1% vs. 1.0%,  $p < 0.001$ ). Non-adherence to medication was observed significantly more often in INVOLP (38.1% vs. 17.3%,  $p < 0.001$ ), who were more likely to live in a psychiatric residency/nursing home (33.1% vs. 16.9%,  $p < 0.001$ ) and less likely to live alone (30.5% vs. 42.0%,  $p < 0.001$ ). (Co)morbid substance abuse, current use of alcohol, suicide attempt prior to presentation, previous psychiatric treatment for any indication or first episode of psychosis did not differ between the two groups.

**Table 1.** Sociodemographic and circumstantial characteristics of the study population.

	All Patients (n = 597)		Involuntary (n = 118)		Voluntary (n = 479)		Post-Hoc			
	n	%	n	%	n	%	df	p	df	p
<b>Sex</b>										
Male	345	57.8%	63	53.4%	282	58.9%	1	0.280		
Female	252	42.2%	55	46.6%	197	41.1%				
Age in years	45.02	17.59 <sup>SD</sup>	48.45	19.17 <sup>SD</sup>	44.15	17.07 <sup>SD</sup>	596	0.016 *		
<b>Means of Presentation</b>										
By foot, accompanied	132	22.1%	13	11.0%	119	24.8%	3	<0.001 **	1	0.001 *
By foot, alone	199	33.3%	7	5.9%	192	40.1%			1	<0.001 **
Ambulance	203	34.0%	58	49.2%	145	30.3%			1	<0.001 **
Police	63	10.6%	40	33.9%	23	4.8%			1	<0.001 **
<b>Suicide Attempt Prior to Presentation</b>										
Yes	21	3.5%	3	2.5%	18	3.8%	1	0.521		
<b>Use of Mechanical Restraint in the PED</b>										
Yes	24	4.0%	19	16.1%	5	1.0%	1	<0.001 **		
<b>Previous Psychiatric Treatment</b>										
Any indication	514	86.1%	99	83.9%	415	86.6%	1	0.441		
First episode of psychosis	87	14.6%	18	15.3%	69	14.4%	1	0.815		

Table 1. Cont.

	All Patients (n = 597)		Involuntary (n = 118)		Voluntary (n = 479)		Post-Hoc			
	n	%	n	%	n	%	df	p	df	p
<b>(Co-morbid) Diagnosis of Substance Abuse Disorder</b>										
Substance abuse	197	33.0%	31	26.3%	165	34.4%	1	0.090		
Abuse of alcohol	51	8.5%	9	7.6%	42	8.8%	1	0.691		
Abuse of other substances	145	24.3%	22	18.6%	123	25.7%	1	0.111		
<b>Current Use of Alcohol</b>										
Inebriation	55	9.2%	11	9.3%	43	9.0%	1	0.906		
BAC	1.44 <sup>M</sup>	0.97 <sup>SD</sup>	1.83 <sup>M</sup>	1.01 <sup>SD</sup>	1.28 <sup>M</sup>	0.95 <sup>SD</sup>	29	0.163		
<b>Non-Adherence to Medication</b>										
Yes	128	21.4%	45	38.1%	83	17.3%	1	<0.001 **		
<b>Living Situation</b>										
Homeless	59	9.9%	10	8.5%	49	10.2%	4	0.002 *	1	0.567
Lives alone	237	39.7%	36	30.5%	201	42.0%			1	0.023
Lives with others	161	27.0%	28	23.7%	133	27.8%			1	0.376
Psychiatric residency/nursing home	120	20.1%	39	33.1%	81	16.9%			1	<0.001 **
Refugee shelter	12	2.0%	2	1.7%	10	2.1%			1	0.786

n: number, df: degrees of freedom, M: mean, SD: standard deviation, PED: psychiatric emergency department, BAC: blood alcohol concentration; \* statistically significant, \*\* highly statistically significant.

Most patients with symptoms of acute psychosis had a primary diagnosis of schizophrenia (ICD–10: F2). INVOLP were more likely to suffer from a primary diagnosis of an organic mental disorder (ICD–10: F0) and less likely to suffer from depressive disorders (ICD–10: F32–33; Table 2).

Table 2. Primary psychiatric diagnosis of patients presenting with acute psychotic symptoms according to ICD–10.

	All Patients (n = 597)		Involuntary (n = 118)		Voluntary (N = 479)		Post-Hoc			
	n	%	n	%	n	%	df	p	df	p
Organic mental disorders (F0)	41	6.9%	16	13.6%	25	5.2%	7	0.006 *	1	0.004 *
Substance-related disorders (F1)	62	10.4%	9	7.6%	53	11.1%			1	0.273
Schizophrenia, schizotypal, and delusional disorders (F2)	407	68.2%	83	70.3%	324	67.6%			1	0.573
Mania and bipolar affective disorders (F30–F31)	25	4.2%	6	5.1%	19	4.0%			1	0.587
Depressive disorders (F32–33)	45	7.5%	3	2.5%	42	8.8%			1	0.022 *
Neurotic, stress-related, and somatoform disorders (F4)	7	1.2%	0	0.0%	7	1.5%			1	0.187
Personality and behavior disorders (F6)	7	1.2%	0	0.0%	7	1.5%			1	0.187
“Others” (F5, 7–9)	3	0.5%	1	0.8%	2	0.4%			1	0.554

n: number, df: degrees of freedom, ICD–10: International Classification of Disease, 10th Version; \* statistically significant.



### 3.2. Psychopathological Aspects of the Study Sample

INVOLP had a significantly higher total PPA score than VOLP ( $12.45 \pm 3.49$  vs.  $10.68 \pm 3.95$ ;  $p < 0.001$ ). As shown in Table 3, a majority of both INVOLP and VOLP presented with delusions (88.1% vs. 86.8%,  $p > 0.05$ ) of which delusions of persecution were most common (54.2% vs. 65.1%,  $p > 0.05$ ). Compared to delusions, disorders of perception were less commonly reported (49.2% vs. 55.7%,  $p > 0.05$ ). While 30.9% of VOLP reported hearing voices, only 14.4% on INVOLP reported this type of hallucination. “Evidence of delusions” (21.2% vs. 8.1%,  $p < 0.001$ ) and “evidence of hallucinations” (19.5% vs. 3.8%,  $p < 0.001$ ) were both significantly more often documented for INVOLP than VOLP. Formal thought disorders were highly prevalent among both INVOLP and VOLP (89.8% vs. 92.9%,  $p > 0.05$ ), especially incoherence/derailment which showed a higher incidence among INVOLP (53.4% vs. 25.5%,  $p < 0.001$ ). Disturbances of affect were significantly more often documented for INVOLP than VOLP (89.8% vs. 87.5%,  $p = 0.048$ ). While INVOLP were most likely to be described as dysphoric/irritable (58.5% vs. 22.1%,  $p < 0.001$ ), VOLP were more likely to have a depressed mood than INVOLP (53.0% vs. 20.3%,  $p < 0.001$ ). Motor restlessness was highly prevalent among INVOLP (70.3% vs. 43.8%,  $p < 0.001$ ; Table 3). A table featuring all aspects of PPA assessed can be found in the supplementary data.

**Table 3.** Aspects of PPA of patients presenting in the PED with acute psychosis according to legal status.

Aspect of PPA	All Patients		Involuntary		Voluntary		chi	df	p
	n = 597	%	n = 118	%	n = 479	%			
<b>Disturbances of Orientation</b>									
Any disturbance of disorientation	92	15.4%	45	38.1%	47	9.8%	58.265	1	<0.001 **
<b>Impairment of Cognition</b>									
Any cognitive impairment	439	73.5%	97	82.2%	342	71.4%	5.679	1	0.017 *
<b>Formal Thought Disorders</b>									
Any formal thought disorder	503	84.3%	106	89.8%	397	82.9%	3.447	1	0.063
Accelerated thinking	92	15.4%	18	15.3%	74	15.4%	0.003	1	0.956
Inhibited/retarded thinking	128	21.4%	25	21.2%	103	21.5%	0.006	1	0.938
Circumstantial thinking	110	18.4%	17	14.4%	93	19.4%	1.580	1	0.209
Restricted thinking	126	21.1%	7	5.9%	119	24.8%	20.335	1	<0.001 **
Tangential thinking	81	13.6%	35	29.7%	46	9.6%	32.480	1	<0.001 **
Incoherence/derailment	185	31.0%	63	53.4%	122	25.5%	34.511	1	<0.001 **
<b>Worries and Compulsions</b>									
Any worry or compulsion	335	56.1%	49	41.5%	286	59.7%	12.710	1	<0.001 **
Suspiciousness	151	25.3%	46	39.0%	105	21.9%	14.587	1	<0.001 **
Fears	255	42.7%	17	14.4%	238	49.7%	48.160	1	<0.001 **
<b>Delusions</b>									
Any delusion	520	87.1%	104	88.1%	416	86.8%	0.140	1	0.708
Delusions of reference	114	19.1%	19	16.1%	95	19.8%	0.853	1	0.356
Delusions of persecution	376	63.0%	64	54.2%	312	65.1%	4.823	1	0.028
Evidence of delusions	64	10.7%	25	21.2%	39	8.1%	16.832	1	<0.001 **

Table 3. Cont.

Aspect of PPA	All Patients		Involuntary		Voluntary		chi	df	p
	n = 597	%	n = 118	%	n = 479	%			
<b>Disorders of Perception</b>									
Any type of hallucination	325	54.4%	58	49.2%	267	55.7%	1.657	1	0.198
Hearing voices	165	27.6%	17	14.4%	148	30.9%	12.874	1	<0.001 **
Visual hallucinations	73	12.2%	18	15.3%	55	11.5%	1.255	1	0.263
Bodily hallucinations	62	10.4%	4	3.4%	58	12.1%	7.733	1	0.005 *
Evidence of hallucinations	41	6.9%	23	19.5%	18	3.8%	36.643	1	<0.001 **
<b>Ego (Boundary) Disturbances</b>									
Any ego disturbance	148	24.8%	19	16.1%	129	26.9%	5.955	1	0.015 *
<b>Disturbances of Affect</b>									
Any disturbance of affect	525	87.9%	106	89.8%	419	87.5%	0.496	1	0.481
Blunted affect	133	22.3%	28	23.7%	105	21.9%	0.179	1	0.672
Depressed mood	278	46.6%	24	20.3%	254	53.0%	40.657	1	<0.001 **
Anxiety	72	12.1%	4	3.4%	68	14.2%	10.425	1	0.001 *
Dysphoria/irritability	175	29.3%	69	58.5%	106	22.1%	60.358	1	<0.001 **
Inner restlessness	61	10.2%	5	4.2%	56	11.7%	5.734	1	0.017 *
<b>Disorders of Drive and Psychomotor Activity</b>									
Inhibition/lack of drive	195	32.7%	22	18.6%	173	36.1%	13.142	1	<0.001 **
Increased drive	178	29.8%	64	54.2%	114	23.8%	41.916	1	<0.001 **
Motor restlessness	293	49.1%	83	70.3%	210	43.8%	26.599	1	<0.001 **
Motor retardation	61	10.2%	13	11.0%	48	10.0%	0.102	1	0.749
Mutism/poverty of speech	74	6.8%	35	29.7%	39	8.1%	40.374	1	<0.001 **
Logorrhea/pressure of speech	68	11.4%	20	16.9%	48	10.0%	4.503	1	0.034 *
<b>Other Disturbances</b>									
Social withdrawal	29	4.9%	3	2.5%	26	5.4%	1.706	1	0.192
Excessive social contact	51	8.5%	26	22.0%	25	5.2%	34.262	1	<0.001 **
Aggressiveness	90	15.1%	57	48.3%	33	6.9%	126.845	1	<0.001 **
Suicidal thoughts	139	23.3%	28	23.7%	111	23.2%	0.016	1	0.899
Suicidal intent	34	5.7%	13	11.0%	21	4.4%	7.755	1	0.005 *
Lack of insight	153	25.6%	90	76.3%	63	13.5%	197.895	1	<0.001 **

PPA: psychopathological assessment, PED: psychiatric emergency department, n: number, df: degrees of freedom. \* statistically significant, \*\* highly statistically significant.

### 3.3. Sociodemographic and Circumstantial Characteristics of the Study Sample

Table 4 presents the results of multivariate regression analysis of sociodemographic and circumstantial characteristics related to IA. Alongside the use of mechanical restraint (OR 13.31, 95% CI 3.91–45.31), means of presentation was the most significant predictor of IA with INVOLP more likely to present via police escort (OR 10.84, 95% CI 5.12–22.93) or ambulance (OR 2.95, 95% CI 1.66–5.25). Furthermore, INVOLP had a higher risk of living in a psychiatric residency or nursing home (OR 2.76, 95% CI 1.56–4.90) and prior non-adherence to medication (OR 2.39, 95% CI 1.37–4.16). Patients with (comorbid) substance use disorders were less likely to be involuntarily admitted (OR 0.53, 95% CI 0.28–0.99).



**Table 4.** Multivariate logistic regression analysis of sociodemographic and circumstantial characteristics associated with involuntary admission to psychiatric care.

Sociodemographic and Circumstantial Characteristics	OR	95% CI		p-Value
		LL	UL	
Ambulance	2.95	1.66	5.26	<0.001 **
Police escort	10.84	5.12	22.93	<0.001 **
(Comorbid) substance use disorder	0.53	0.28	0.99	0.048 *
Non-adherence to medication	2.39	1.37	4.16	0.002 *
Psychiatric residency/nursing home	2.76	1.56	4.90	0.001 *
Use of mechanical restraint in PED	13.31	3.91	45.31	<0.001 **

OR: odds ratio, 95% CI: 95% confidence interval, LL: lower limit, UL: upper limit, PED: psychiatric emergency department; \* statistically significant, \*\* highly statistically significant. Variables included in multivariate analysis after univariate testing with  $p > 0.25$ : Time of presentation, means of presentation (ambulance, police escort, unaccompanied by foot, accompanied by foot), (comorbid) substance use disorder, inebriation, non-adherence to medication, living situation (lives alone, psychiatric residency/nursing home), use of mechanical restraint in PED.

### 3.4. Psychopathological Predictors of Involuntary Admission of Psychiatric Care

Among all variables assessed, aggressiveness (OR 6.18, 95% CI 3.24–11.80), and suicidal intent (OR 5.55, 95% CI 5.54–2.29) were the most significant risk factors of IA. Moreover, disorientation increased risk of IA by a 4.7-fold (95% CI 2.46–8.83) and the formal thought disorder tangential thinking was associated with a 4-fold higher risk of IA (95% CI 2.08–7.52). Suspiciousness further contributed to the risk of IA (OR 2.80, 95% CI 1.52–5.17), whereas patients stating fears were 4 times less likely to be involuntarily admitted (OR 0.25, 95% CI 0.13–0.49; Table 5).

**Table 5.** Multivariate logistic regression analysis of aspects of psychopathological assessment associated with involuntary admission to psychiatric care.

Aspect of PPA	OR	95% CI		p-Value
		LL	UL	
Disorientation	4.66	2.46	8.83	<0.001 **
Aggressiveness	6.18	3.24	11.80	<0.001 **
Tangential thinking	3.95	2.08	7.52	<0.001 **
Suspiciousness	2.80	1.52	5.17	0.001 *
Fears	0.25	0.13	0.49	<0.001 **
Suicidal intent	5.54	2.29	13.43	<0.001 **

PPA: psychopathological assessment, OR: odds ratio, 95% CI: 95% confidence interval, LL: lower limit, UL: upper limit; \* statistically significant, \*\* highly statistically significant. Variables included in multivariate analysis after univariate testing with  $p > 0.25$ : unkempt, inappropriate attire, any disturbance of orientation, disorder of consciousness, aggressiveness, any ego (boundary) disturbance, formal thought disorders (inhibited/restricted thinking, tangential thinking, thought blocking/disruption, incoherence/derailment), delusions (delusions of persecution, hypochondriacal delusions, delusions of grandiosity, systemized delusions, evidence of delusions), disorders of perception (hearing voices, visual hallucinations, bodily hallucinations, evidence of hallucinations), disturbances of affect (depressed mood, hopelessness, anxiety, dysphoria/irritability, inner restlessness, parathymia, ambivalence), disorders of drive and psychomotor activity (inhibition/lack of drive, increased drive, motor restlessness, mannerisms/histrionics, mutism/poverty of speech, logorrhea/uncontrollable speech), other disturbances (social withdrawal, excessive social contact, suicidal intent, self-harm, lack of insight).

## 4. Discussion

As patients suffering from symptoms of acute psychosis present a relevant share of INVOLP, a sound understanding of risk factors contributing to IA in this specific group of patients is clinically relevant. Most previously conducted studies examining predictors of IA have focused on the whole subpopulation of INVOLP which has led most researchers to establish that symptoms associated with psychosis and/or a diagnosis of schizophrenia [5,9,16,19,20,32,33] as well as a diagnosis of an organic mental disorder [2,5,19,20] are relevant contributors to IA. Significantly fewer studies have addressed risk factors specific to patients with acute psychosis [15,22–24].

Kelly et al. determined that only lack of insight was a significant risk factor of IA in a cohort of 95 patients with first-episode psychosis (FEP), whereas neither positive nor negative symptoms were relevant predictors [22]. On the other hand, Huber et al. found a significant correlation of neuropsychological dysfunction (i.e., decreased concentration and attention) and a high score within the “excited component” as classified by the Brief Psychiatric Rating Scale (BRPS) with IA among 412 patients with FEP [23]. A third study examining 18,645 patients with early psychosis found primary psychopathological determinants of IA to be lack of insight, symptoms of mania, self-harm, and aggressive behavior [24]. When extending criteria to include not only FEP, but patients with psychosis or schizophrenia in general, Kaikoushi et al. identified disorganized behavior to be the most significant symptomology of IA among 406 patients [15].

#### *4.1. Sociodemographic and Circumstantial Characteristics of the Study Sample*

This study detected four significant circumstantial predictors of IA as well as two sociodemographic predictors, of which (comorbid) substance use disorders resulted in lower rates of IA. The latter may appear counterintuitive at first glance. Substance use disorders occur commonly in patients suffering from schizophrenia and are related to a dramatic worsening of their overall clinical course of illness. Their co-occurrence is bidirectional: while patients with psychosis may feel the need to alleviate symptoms by turning to substance use, drug use, especially of illicit drugs, this is commonly associated with the occurrence of psychotic symptoms [34]. Acute intoxication is associated with extreme agitation [9] and may lead to significant alterations of the mind which depending on the substance used affect perception, emotion, cognition, and sense of self [35]. Alcohol intoxication, for example, is associated with violent and criminal behavior [36], whereas the use of psychedelic drugs may result in a wide array of perceptual distortions including hallucinations [35]. In general, (illicit) drug use is associated with impaired judgement, delinquency, and suicide [37]. All of these aspects would presumably contribute to a higher risk of IA [9,16,24,38], however, this was not the case in the present study. A review analyzing the differences in clinical features of substance-induced psychotic disorder (SIPD) in comparison to primary psychotic disorders with concurrent substance abuse found that SIPD correlated with a greater degree of insight, fewer positive symptoms, more depression, and more anxiety [39]. The present study’s observation may indicate that substance use is also associated with a higher degree of subjective burden leading this group of patients to seek treatment by their own choice. Alternatively, substance abuse and current intoxication may be under-diagnosed in INVOLP, as obtaining a complete medical history may be particularly difficult.

Unsurprisingly, the most significant circumstantial predictor of IA was the use of mechanical restraint in the PED. While Maina et al. also determined mechanical restraint to significantly contribute to the risk of IA, they found that patients with schizophrenia were less likely to be subjected to mechanical coercion than patients with personality disorders or manic/mixed episodes of an affective disorder [9]. Ideally, mechanical restraint is reserved for situations in which other de-escalating means have proven insufficient in protecting the safety of the patient and others. Assuming that this purpose was served within this study population, patients under mechanical restraint had the highest levels of aggression, agitation, and erratic behavior. In line with this observation, aggressiveness was the psychopathological aspect associated with the highest risk of IA in the present study.

As described in several other studies, means of presentation was a significant determinant of IA. The presence of aggression, agitation, and delirium is associated with a higher risk of admission via police escort [16,40]. Voluntary legal status is more common among patients brought to the PED by friends or family members or those presenting unaccompanied [40]. While presentation by foot either alone or accompanied did not show a significant relationship to IA in multivariate analysis, this study observed that patients presenting on their own had the overall lowest chance of being involuntarily admitted (5.9%) while those presenting accompanied by friends, caregivers, or family had a two-fold

higher risk (11.0%), implying that IA is associated with the extent of extrinsic motivation required in enabling emergency presentation.

Non-adherence to (antipsychotic) medication, recognized as one of the most challenging aspects in the treatment of schizophrenia and leading to a greater risk of relapse, hospitalization, and suicide [41], has been associated with a higher incidence of IA [15,20]. The present study found non-adherence to increase risk of IA by a 2.4-fold, whereas other variables (e.g., police escort, use of restraint), which may ultimately be the result of non-adherence and exacerbation of disease, contributed a significantly higher OR. This finding indicates that non-adherence on its own is a predictor of involuntary admission [15] and perhaps also severity of illness [42]. This most likely applied mainly to patients admitted by guardianship order according to federal law (i.e., BGB) for patients requiring (non-immediate) treatment for example after increasing deterioration of illness, self-neglect, and social withdrawal following the discontinuation of medication.

Residents of psychiatric residencies and nursing homes were more likely to be involuntarily admitted than patients under other living conditions. Patients living in specialized care facilities are generally unable to care for themselves and more severely ill [43], presenting a risk factor for IA in itself. As residents of psychiatric and nursing homes are closely supervised by specialized nursing staff, establishing a more thorough medical history may be facilitated allowing a more comprehensive evaluation of the current situation. However, physician decision-making may also be guided by care givers and nursing staff, leading the physician on call to feel coerced to involuntarily admit these patients [44]. Due to the closer supervision these patients receive, it would seem reasonable to assume that residents of psychiatric residencies are less likely to be non-adherent. This consideration contradicts the previously discussed risk factor of non-adherence to medication and may indicate that non-adherence and its consequences on psychopathology (e.g., aggression, disorganized behavior) may be particularly poorly tolerated within this setting.

#### 4.2. Psychopathological Predictors of Involuntary Admission of Psychiatric Care

In samples examining IA in general (i.e., independent of symptoms/diagnosis), delusional content and false sensory perceptions are strong determinants of IA [5,9,16,19,33]. The present study exclusively examining patients presenting with positive symptoms was unable to detect a significant impact of the variables of delusions and hallucinations on legal status, even when examining different sensory entities and thought content. Aggressive behavior, which was a significant determinant of IA associated with a six-fold increased risk of IA, in patients with acute psychosis may be the result of delusional content and disorders of perception. Other authors have shown a relevant relationship between a subset of delusional beliefs and expression of violence which could contribute to the assumption that delusional content is also related to IA. “Ego-dystonic” grandiose delusions in which the patient believes to have unique qualities [45], delusions of persecution, being spied on, and conspiracy have been associated with a higher level of aggression especially when the affected patient acts on the delusional content [46,47]. On the other hand, persecutory delusions may be associated with a higher level of emotional distress [48] leading patients to seek help voluntarily. While clinical experience suggests that the presence of hallucinations that command the patient to engage in violent behavior significantly contributes to aggressiveness [49] and therefore to IA, this could not be observed in the present study. Buchanan et al. found that there was no objective correlation between delusional phenomenology and acting on a delusion [50]. The present results also suggest that delusional content is—at least when considered alongside other aspects of PPA such as aggressiveness—not a relevant predictor of IA in patients with symptoms of acute psychosis. Alternatively, both the category “evidence of delusional content” and “evidence of hallucinations” more often applied to INVOLP implying that INVOLP are unable to sufficiently communicate this content or are too mistrusting to do so.

Suspiciousness, on the other hand, was attributed a nearly three-fold increased risk of IA. A review considering the relationship of paranoia and aggression in psychosis initially

showed mixed results. Under consideration of only higher-quality studies, a positive correlation was shown [51]. The presence of paranoia may also contribute to the inability of establishing a trusting patient–physician relationship which may further necessitate the use of coercive measures.

Alongside content thought disorders, formal thought disorders are a core feature of psychosis [52]. In the present study, tangentiality, a formal thought disorder commonly associated with psychosis, was a significant psychopathological predictor of IA. The main features of tangential thinking include a constant digression to irrelevant topics, failure to arrive at the main point of a statement, and inability to respond to questions in a concrete and precise manner. The presence of this particular feature may have led to a severely disturbed patient–physician communication and insufficient answers to questions highly relevant to a psychiatric emergency situation (e.g., addressing suicidality). As a result, and in combination with positive symptoms, the treating physician in the PED may have seen a higher potential for capricious behavior and subsequently been more hesitant in supporting a voluntary legal basis of treatment.

This psychopathological item of disorientation most likely showed the highest prevalence among patients with dementia and/or delirium or intoxication, however, a patient suffering from acute psychosis may also be considered disoriented due to their disconnection from reality. Studies have shown that up to 30% of inpatients with schizophrenia demonstrate age disorientation which is also an indicator of a greater severity of symptoms [53] and is associated with a higher likelihood of violence [54]. Furthermore, disorientation is one of the hallmark indicators of delirium [55], a condition warranting immediate inpatient care.

Suicidality in association with IA has shown inconsistent effects [33]. In studies specifically examining the risk of IA in patients with acute psychosis, the expression of suicidal thoughts and/or intent appears to correlate with the risk of IA [15,23] even if only to a small extent [24]. When examining the risk of IA irrelevant of psychiatric diagnosis, suicidality as a symptom of severely depressed mood has been linked to voluntary legal status [16,40]. This indicates that suicidality is taken under consideration alongside other patient characteristics, the patient’s current emotional and cognitive state, and the clinical context. Karasch et al. found that patients with non-affective disorders were more likely to be admitted involuntarily due to suicidal tendencies than those suffering from an affective disorder [19]. The present study specifically assessed suicidal intent, implying that the patient reported thoughts of engaging in suicidal behavior. When paired with other psychopathological features such as acute psychotic symptoms, suicidal patients are at high risk of suicidal attempts [56].

The expression of fears showed a negative correlation with IA with affected patients four times more likely to seek voluntary treatment. This finding may suggest that psychopathological aspects associated with lower subjective well-being are more often present in patients treated on a voluntary legal basis. Other authors have found that patients with a reduced mood level [16,24,40] and higher levels of anxiety [40] were more often voluntarily hospitalized.

#### 4.3. Limitations

The results from this study should be interpreted in the context of its limitations. The data presented here stems from a single institution over the duration of one year and is, therefore, not necessarily representative of other settings or time periods. Unlike circumstantial and sociodemographic data, which is specific to each emergency situation and patient, aspects of PPA are more subjective. Information documented during PPA is both a result of direct question by the treating physician as well as a result of observation of the patient and information spontaneously volunteered by the patient. The individual style of documentation of PPA varied in certain features between different psychiatrists (i.e., some did not routinely include sleeping disorders or circadian disturbances), however, most components considered relevant for this study were regularly assessed. Because

of the emergency department setting and potential shortage of time, quality of PPA was occasionally lacking. Moreover, while great efforts were made to objectify data collection, confirmation bias cannot be fully ruled out.

PPA was assessed based solely on whether a certain characteristic applied or not. A quantification of these criteria was not performed due to insufficient information in regard to severity of symptoms in many PPAs. Therefore, this study only allows for a comparison of patients presenting with a certain characteristic of PPA or not, but not how pronounced that characteristic was, an aspect which presumably has a significant effect in real life.

## 5. Conclusions and Clinical Implications

IA of patients suffering from acute psychosis appears to be the result of circumstantial factors surrounding the involuntarily admitted patient and the severity and presence of certain psychopathological features such as aggression, suspiciousness, and tangential thinking which may strongly impede the patient-physician relationship. It is of utmost importance to continually reexamine the use and influencing factors of coercion in psychiatry and reassess aspects which may have been previously neglected [4]. While several factors contributing to the risk of IA such as aggression, police escort, and non-adherence show unanimous findings in most studies, others appear to underlie regional or local influences. By understanding the surrounding influencing factors, patient care can be improved and optimized with the aim of reducing the use of coercion and the rate of IA.

**Supplementary Materials:** The following are available online at <https://www.mdpi.com/article/10.3390/psychiatryint2030024/s1>, Table S1: Univariate logistic regression analysis of aspects of psychopathological assessment in patients presenting in the emergency according to legal status.

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**Informed Consent Statement:** Patient consent was waived as data was collected retrospectively and was fully pseudonymized. The data presented in this study applies to two groups of patients and does not allow for a back-tracking of specific patients.

**Data Availability Statement:** Data can be made available upon reasonable request.

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