

## Predictors of physical restraint in a psychiatric emergency setting

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### Abstract

**Background:** Considering the negative consequences of using physical restraints, we conducted this study to identify patients who are more frequently restrained in a psychiatric emergency ward as an initial step to limit the use of restraint to the minimum possible.

**Methods:** This was a retrospective case control study conducted in Iran Psychiatric Hospital in Tehran, Iran. We reviewed the files of 607 patients who were admitted during a one year period using convenience sampling; of them, 186 were in the restrained group and 421 in the unrestrained group.

**Results:** Surprisingly, no significant difference was found between the restrained and unrestrained groups in demographic characteristics. The patients who were referred because of violence were diagnosed as having methamphetamine induced psychotic disorder or bipolar I disorder in manic episode and had a higher odds of being restrained (OR=2.51, OR=1.61, and OR=1.57 respectively). Being restrained was also associated with a longer duration of hospitalization and duration of staying in the emergency ward. Moreover, patients in their first admission were more frequently restrained.

**Conclusion:** Medical and nursing staff should consider special measures for the patients who are at a higher risk for being restrained. More frequent visits and education for both patients and staff may be effective in reducing the number of physical restraints for these groups of patients.

**Keywords:** Physical Restraint, Psychiatric Emergency Settings, Case-Control Studies.

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### Introduction

Physical restraint is a coercive intervention that is sometimes used in psychiatric emergency wards (1,2). Although highly disputed, physical restraint is inevitable in some situations in order to prevent patients from harming themselves or others. However, it may result in complications and problems for both the staff and patients (3,4) such as assaults to staff that might lead to absence from work (5) or soft tissue injuries, fractures or delirium in patients (6). In the most extreme cases, it has even been reported to cause patients' death (7,8).

Therefore, it is desirable to limit the use of restraint to the minimum possible. It is estimated that 75% of the physical restraints and seclusion could be prevented by implementing appropriate mechanisms like sharing the treatment plan with patients, remodeling the emergency environment, training staff how to perform de-escalating techniques and less forceful interventions and how to recognize factors which lead to violation, and giving regular feedback to staff and so on (9).

Little evidence exists about the rate of restraints in mental hospitals of the develop-

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ing countries. Only anecdotal reports about the occasional cases of injuries or fractures demonstrate a possible existing problem. Local experts estimate that a large number of restraints are performed without alerting the physicians, and sometimes the staff use restraints as a punishment for the misbehavior or even excessive talkativeness of the patients.

In order to recognize the extent of and prevent the unnecessary use of force in psychiatric emergencies, we need to distinguish those patients who are most likely to be restrained, and the situations which may increase the probability of restraint. Therefore, we decided to study the characteristics of restrained patients as well as the process of restraining in a large psychiatric hospital. To our knowledge, only two studies conducted in Brazil has evaluated the characteristics of the restrained patients in a developing country (10,11). The purpose of this study was to assess the demographic and clinical characteristics of the restrained and unrestrained patients in one of the largest mental hospitals in Iran.

### Methods

This was a retrospective case control study conducted in Iran psychiatric hospital in Tehran. This study was performed from March 20, 2010 to March 19, 2011. Review board of Iran University of Medical Sciences approved this study. Iran psychiatric hospital, the educational center of psychiatry in Iran University of Medical Sciences, is one of the largest public referral psychiatric centers in Tehran. We reviewed all of the files of the 607 patients who were admitted in the psychiatric emergency ward during the study period. Generally, in the hospital, patients were first visited by psychiatric residents, their medical history was taken and diagnosis was made; then the diagnosis was authenticated by the attending psychiatrists based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IVTR)(12).

Out of the 607 patients, 186 were re-

strained at least once during their stay (restrained group) and 421 were not restrained (unrestrained group). Data were collected from the patient's files according to the researcher's designed format. The restrained group included patients who experienced at least one physical restraint during their hospitalization period and the unrestrained group included patients who did not experience any physical restraint in this period. Patients who were hospitalized for less than 48 hours and patients under 18 years of age were excluded. The following data were collected for both restrained and unrestrained groups: Age, gender, marital status, occupation, type of admission (coercive vs. voluntary), chief complaint at admission, past psychiatric admission history, history of physical restraint (previous physical restraint), duration of staying in the emergency ward, and duration of admission in hospital (if the patient was transferred from the emergency ward to a general psychiatric ward).

For the restrained group, we investigated the number of physical restraint(s) for each patient and the nursing shift was registered as well. We also checked the records in the patients' files to find the reason for the physical restraint, the duration of physical restraint, and whether caring of extremities and watching the vital signs were recorded. Then we analyzed the data and the relation between them using IBM SPSS Statistics 20, t-test and Chi square. Due to the low number of patients in some diagnostic subgroups, we combined the smaller groups. Taking this approach, we combined Bipolar I Disorder (BID) manic episode with mixed episode, and MDD with BID depressive episode.  $P < 0.05$  was considered as significant.

### Results

Table 1 shows no significant difference between the restrained and unrestrained groups in demographic characteristics. Most of the patients were male, and within the age range of 18–29, with a preliminary educational level. Moreover, most of the

Table 1. Demographic Characteristics of Restrained and Not Restrained Patients

Variable	Restrained		Unrestrained		p	$\chi^2$
	N	%	N	%		
Age					0.308	4.803
18-29	82	29.8%	193	70.2%		
30-39	71	34.8%	133	65.2%		
40-49	23	26.7%	63	73.3%		
50-59	6	18.2%	27	81.8%		
60-75	2	33.3%	4	66.7%		
Gender					0.807	0.060
Female	39	29.8%	92	70.2%		
Male	147	30.9%	329	69.1%		
Educational Level					0.657	1.613
Illiterate	5	21.7%	18	78.3%		
Preliminary	85	30.5%	194	69.5%		
High school	77	32.6%	159	67.4%		
College	19	27.5%	50	72.5%		
Occupational Status					0.370	0.802
Employed	68	28.5%	171	71.5%		
Unemployed	117	31.9%	250	68.1%		
Marital Status					0.670	1.555
Single	90	30.6%	204	69.4%		
Married	81	31.5%	176	68.5%		
Divorced	15	28.3%	38	71.7%		
Widow	0	0%	3	100.0%		
Referral Status					0.465	0.534
Voluntary	27	34.2%	52	65.8%		
Involuntary	159	30.1%	369	69.9%		

patients were single, unemployed and admitted involuntarily (Table 1).

Although violence was the most frequent reason for referral in both groups, it was significantly higher in the restrained group ( $p < 0.001$ ) with an odds ratio (OR) of 2.51 (95%CI 1.72 to 3.65) (Table 2). Axis I diagnosis was also different between the restrained and unrestrained groups (Table 3) ( $p = 0.006$ ). Patients with methamphetamine induced psychotic disorder (MIP) were more frequently restrained (OR relative to any other Axis I disorder = 1.61, 95%CI

1.05 to 2.46), followed by the patients with BID/manic episode (OR relative to Axis I disorders other than MIP = 1.57, 95%CI 1.05 to 2.33), and the patients with a depressive episode were less frequently restrained than other patients (OR = 0.29, 95% CI 0.13 to 0.65).

There was a marginally significant difference in Axis II diagnosis between the two groups ( $p = 0.055$ ). Most patients did not have an axis II diagnosis, and those with a diagnosis of cluster B personality disorder were more frequently restrained than the

Table 2. Referral Characteristics of Restrained and Not Restrained Patients

Characteristics	Restrained		Unrestrained		p	$\chi^2$
	N	%	N	%		
Reason for Referral					<0.001	28.585
Violence	136	73.1%	219	52.1%		
Delusion & Hallucination	16	8.6%	60	14.2%		
Suicide	3	1.6%	41	9.8%		
Depression/Crying	6	3.2%	27	6.4%		
Others	25	13.4%	73	17.4%		
Total*	186	100.0%	420	100.0%		
Admission History					0.213	5.814
No Admission History	116	62.4%	260	61.8%		
Once	35	18.8%	96	22.8%		
Twice	9	4.8%	28	6.7%		
Three Times & More	26	14.0%	37	8.7%		
Total	186	100.0%	421	100.0%		

\*1 missing

Table 3. Patients' Axis I and Axis II Diagnoses

Diagnosis	Restrained		Unrestrained		Total N	p	$\chi^2$
	N	%	N	%			
Axis I Diagnosis						0.006	17.961
No Diagnosis	4	40.0%	6	60.0%	10		
Schizophrenia and Schizoaffective Disorder	38	28.1%	97	71.9%	135		
MIP	44	39.3%	68	60.7%	112		
Substance Induced Psychotic Disorder	15	28.3%	38	71.7%	53		
BID Manic or Mixed Episode	63	34.6%	119	65.4%	182		
MDD or BID Depressive Episode	7	10.9%	57	89.1%	64		
Others	15	29.4%	36	70.6%	51		
Axis II Diagnosis						0.055	7.602
No Diagnosis	130	33.2%	261	66.8%	391		
Borderline Personality Disorder	15	31.9%	32	68.1%	47		
Other Cluster B Personality Disorders	11	37.9%	18	62.1%	29		
Others	30	21.4%	110	78.6%	140		

MIP, Methamphetamine Induced Psychosis

Table 4. Measures of Restraint Duration and Episodes

	Case (Mean±SD)	Control (Mean±SD)	p
Duration of Staying in Emergency in Current Admission (days)	10.10±6.447	7.52±5.003	<0.001
Whole Duration of Staying in the Hospital in Current Admission (days)	25.68±15.805	15.70±14.053	<0.001
Number of Restraint for Each Patient	2.23±1.984	-	-
Restraint in Each Work Shift			
Shift 1 (7AM-1PM)	2.38±1.499	-	0.221
Shift 2 (1PM-7PM)	1.81±1.030	-	
Shift 3 (7PM-7AM)	1.86±1.315	-	

patients with other Axis II diagnoses (Table 3). Due to the large number of diagnosis of borderline personality disorder, this disorder was reported separately from other cluster B personality disorders.

Most patients did not have hospitalization history (Table 2). We measured both the total duration of admission in hospital and duration of staying in the emergency ward to find out whether there was a difference between the restrained and unrestrained patients on these measures. Both the mean of duration of hospitalization and duration of emergency stay were significantly higher in the restrained group than the unrestrained group (Total hospitalization: 25.6 vs. 15.7 days,  $p < 0.001$ ; emergency stay: 10.1 vs. 7.5 days,  $p < 0.001$ ).

Most restraint patients were restrained only once, but the mean number of restraints for each patient was 2.23 times. We did not find a significant difference in the number of restraints between morning, afternoon, or evening and night shifts (Table 4). Nonetheless, we expected a lower number of restraints in the evening and night shift when patients are mainly asleep. Physicians' or-

ders for restraint were not carefully written, and there were no records of the reason for the restraint in most patients' files (78% of cases). Patients' violence was the most common reason for the restraint in those orders that mentioned the reason. In most orders, however, checking the vital signs and circulation of extremities and duration of restraint episode were recorded (Table 5).

## Discussion

This study showed that compared to unrestrained patients, restrained patients were more commonly admitted with a reason for referral of violence, had an Axis I diagnosis of methamphetamine induced psychotic disorder, had an Axis II diagnosis of cluster B personality disorder and stayed for a longer duration in the emergency ward and other wards of the hospital.

In this study, the demographic characteristics of the two groups were identical. However, male and young patients were more often restrained in some other studies (1,7). On the other hand, Bergket al. 2011 did not find a difference in the em-

Table 5. Characteristics of Restrained Patients and Physicians' Orders

		N	%
Number of Fixation during Hospitalization			
	Once	94	50.5%
	Twice	45	24.2%
	Third Times	20	10.8%
	Fourth times and More	27	14.5%
Reason of the Restraint			
	Violence	39	21.0%
	Agitation	2	1.0%
	Not Recorded	145	78.0%
Record of Checking the Vital Signs in the Physicians' Hand Written Order			
	Yes	147	79.0%
	No	39	21.0%
Record of Duration of Restraint in the Physicians' Hand Written Order			
	Yes	151	81.2%
	No	35	18.8%

ployment status of the restrained vs. unrestrained patients (13). The lack of difference in demographic characteristics of restrained and unrestrained patients might be due to the fact that our center is a referral center that receives the most severe cases. Therefore, the severity of the disorders might have covered any possible effect of the demographic characteristics.

In our study, no difference was found in the number of restraining patients who were admitted voluntarily or involuntarily; this is not in line with Knutzen 2011 who showed that involuntary referral to hospital was significantly higher in the restrained group (1). This difference could be related to the fact that only a small minority of the patients in our study was admitted voluntarily, and their diagnoses were not very different from those in the involuntary group. It confirms that in this study the type of admission did not distinguish the two different subgroups of patients; and this is counterintuitive, because we expect that the patients with intact insight be admitted voluntarily compared with those with impaired insight that are admitted coercively. However, this might not happen in an overcrowded emergency ward where nearly all of the admissions are for severe and complicated cases. In such a setting, not enough room remains for "real" voluntary admissions.

In this study, previous admission history had no association with being restrained.

However, Knutzen 2011 found that having a history of several admissions was more common in restrained patients and concluded that this group probably had poor insight, poor treatment, and negative experience with mental health (1). The observed difference might be due to unnecessary restraining of the patients during their first admission when they are not yet familiar with the ward's rules and routines.

In this study, duration of hospitalization and time of staying in the emergency ward were significantly higher in the restrained group; and this is consistent with the findings of several studies (1,7,14); for example, in the study of Goldbloom et al., the duration of hospitalization in restrained and unrestrained patients were  $42.1 \pm 40.5$  and  $18.1 \pm 18$  days, respectively (7); this indicates that either restrained patients need more time for inpatient management and preparing themselves for discharge from the hospital, or the staff have decided that they need a longer hospitalization.

As it could have been predicted, the reason for referral of violence was associated with a higher chance of being restrained in this study. Although this finding seems obvious at the first glance, it shows that the staff should pay special attention to these patients that have a 2.5 fold increase in the chance of being restrained during their hospitalization. Therefore, the reason for referral of patients with aggression or violence could be considered an alarming sign for



the emergency staff at the beginning of the admission that merits a more aggressive treatment plan.

The patients with MIP and BID manic or mixed episode had higher odds of being restrained than other patients. This is particularly important in emergency settings where the patients with BID have the most prevalent diagnosis, and a large number of patients with MIP are visited every day. In the study of Knutzen et al., in which the diagnoses were based on ICD-10, the most common diagnosis in the restrained group was schizophrenia (1). The higher rate of restraint for the patients with BID in our study may be due to over-activity, talkativeness, and disturbing behaviors that are common in these patients, which may result in unnecessary restraining of the patients. It has been anecdotally reported that some patients have been restrained even for their intrusive behavior or excessive questions.

The patients with MIP were also more frequently restrained than the patients with other Axis I disorder except for BID manic or mixed episode. This finding is consistent with our expectations because of the high rate of aggression observed in the patients with MIP (15). Agitation and violent behaviors are common in methamphetamine users (16), and it may be necessary to sedate or restrain them in the emergency ward (17).

Considering Axis I diagnosis, only a marginally significant association with being restrained was observed with cluster B personality disorders. Personality disorders are one of the risk factors for violent behaviors (18). Borderline personality disorder poses major management problems including being more often restrained (19). Restraints occur more frequently following micro psychotic episodes or impulsive behaviors in these patients (20).

There was a physician hand written order for patient restraint in all files, but there were deficits in recording the reason for the restraint, the time and its duration. Surprisingly, the reason for restraint was not recorded in most of the patients' files. This

suggests that restraints were often done before the physician visited the patients and even without the physician's permission, which is not in line with the emergency protocols. Although it is acceptable that the staff could restrain the patient without informing the physician in some emergency situations, it is very unusual that this would happen in most of the cases, particularly in those cases that were done in the morning shifts when the physicians are present in the emergency ward.

In most orders, checking the vital signs and the blood supply of the extremities and duration of the restraint were recorded. This shows that the physicians have been considerate about the possible adverse effects of restraining and have limited the duration of restraint as well. However, it is also possible that the restraint orders were not individualized for each patient and only were "stereotypically" copied regardless of each patient's unique condition; the orders included checking the vital signs and extremity with a fixed duration, but the reason for intervention was not included.

The findings of this study revealed that restraint was not used according to the predetermined indications or as a standard medical intervention in a significant number of the cases. This is especially important because the medical protocols and guidelines suggest limiting the use of restraints to the minimum possible (8,21). With implementing the suggested protocols to control agitation in emergency settings, we could expect to reduce the number of unnecessary restraint (22,23). However, correct implementation of the protocols will not succeed without paying adequate attention to the workload and mental health of the emergency staff. The followings are some of the issues that should be addressed before observing an enduring positive change in the situation: Exhausting workload and inadequate number of emergency staff, sense of insecurity, psychosocial and financial problems, and inadequate training, debriefing techniques, verbal de-escalation, and crisis management (8,24-27).

One limitation of this study was that we only studied one referral hospital that generally admits very severe cases that might not be typical of other mental hospitals. The large capacity of the hospital allows it to receive most of the patients of the West of Tehran and Karaj, although it also has cases from all over the country.

## Conclusion

The patients admitted in the psychiatric emergency wards with a chief complaint of aggression who are diagnosed with MIP or BID in manic episode are more probably restrained during their hospitalization. Incompleteness of restraint orders (especially not mentioning the reason for the restraints) suggests that the majority of the restraints were done in the absence of physicians and after the patient had been restrained.

Important measures should be considered to decrease the number and adverse effects of unnecessary restraints including periodical educational programs for staff on debriefing techniques, verbal de-escalation, and crisis intervention as well as to decrease the workload of the staff to a reasonable amount.

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