Original Article

The association of methamphetamine use and restrictive interventions in an acute adult inpatient mental health unit: A retrospective cohort study

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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the [Version of Record](#). Please cite this article as [doi: 10.xxxx/inm.12283](#)

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39 Authorship statement:

40 All authors contributed to the conceptualisation and conduct of the research. All authors
41 contributed to and approved the final version of the manuscript. KK, BL, JA, ED collected data.
42 SM and MT analysed data. BM, TM, SM, and TF contributed to manuscript preparation, data
43 analysis fidelity and accuracy, and interpretation.

44

45 Acknowledgements

46 The authors acknowledge the outstanding care delivered by staff at both the ED and the inpatient
47 unit and assistance with data collection. Kathleen Kelly was awarded a 2015 NorthWestern
48 Mental Health Seed Grant fund to support this project.

49

50 Disclosure

51 The authors report no conflict of interest. The authors are responsible for the content and writing
52 of the paper.

53

54 Word count

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Received Date : 11-Apr-2016

Revised Date : 03-Aug-2016

Accepted Date : 07-Sep-2016

Article type : Original Article

ABSTRACT

The aim of the study was to describe incidences of restrictive interventions and the association of methamphetamine use at an acute adult inpatient mental health unit in metropolitan Melbourne. A total of 232 consecutive consumer admissions to the inpatient unit across a three-month period were described for illicit substance use and the use of restrictive interventions (seclusion, mechanical restraint, and physical restraint) prior to and during admission. Of all admissions, 25 (10.8%) involved consumers subjected to a restrictive intervention. Methamphetamine use was either self-reported or detected by saliva test for 71 (30.6%) consumers. Following multivariate analyses, methamphetamine use (OR 7.83, 95% CI: 2.33 to 26.31) and restrictive intervention in the emergency department prior to admission (OR 8.85, 95% CI: 2.83 to 27.70) were significant independent predictors of the use of restrictive intervention after inpatient admission. Anecdotal observations provided by clinical mental health staff that consumers intoxicated with methamphetamine appear to require restrictive intervention more frequently than other consumers was confirmed with the results of the current study. As the state of Victoria is on a pathway to the elimination of the use of restrictive interventions in mental health services, clinicians need to develop management strategies that provide specialist mental health care using the least restrictive interventions. Although 26.8% of methamphetamine users were secluded after admission, restrictive interventions should not be the default management strategy for consumers who present with self-report or positive screen for methamphetamine use.

Keywords; methamphetamine, seclusion, restrictive interventions, serious mental illness

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30 INTRODUCTION AND BACKGROUND

31 People in mental health crisis may require transportation to a hospital emergency department
32 (ED) under Section 351 of the Victorian Mental Health Act 2014 for assessment and treatment.
33 Mental health crisis ED presentation can result in the use of resistive intervention including
34 seclusion (Innes et al. 2014) physical restraint (Al-Kkafaji et al. 2014), and mechanical restraint
35 (Gerace et al. 2014). Restrictive interventions are coercive and may cause all involved to feel a
36 range of negative emotions and may damage the therapeutic relationship (Steinert et al. 2013). In
37 Australia, following mental health assessment in an ED, approximately one third of people in
38 mental health crisis are admitted to an acute inpatient mental health unit (AIHW 2012), often for
39 compulsory treatment under mental health legislation (e.g., Section 28, the Victorian Mental
40 Health Act 2014).

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42 Illicit drug use and a diagnosis of serious mental illness (i.e., schizophrenia, schizoaffective
43 disorder, bipolar disorder, and major depressive disorder) commonly co-exist (Medhus et al.
44 2013). Methamphetamine use can lead to aggressive and violent behaviour (McKetin et al.
45 2014). Methamphetamine use can exacerbate paranoia and psychosis, which are common
46 withdrawal symptoms (Chen et al. 2015). Under the Victorian Mental Health Act (2014)
47 restrictive interventions may be used to reduce the risk of harm to self or others due to aggressive
48 or violent behavior in designated mental health settings. Although methamphetamine use is
49 positively correlated with violence (Brech & Herbeck 2013), to date there is no empirical
50 evidence linking methamphetamine use and withdrawal with the use of restrictive interventions
51 in acute inpatient mental health services.

52

53 The community-based use of methamphetamine in 2013 was reported at a similar rate to that of
54 2010 at approximately 2% of people aged over 14 years (AIHW 2014). However, the use of ‘ice’
55 or crystal methamphetamine has doubled across that time (AIHW 2014). The national rate of
56 methamphetamine use in 2015 is merely speculative, yet recent media saturation and the Federal

Government's announcement of the 'National Ice Action Strategy' to complement the next National Drug Strategy and the National Alcohol Strategy (Department of Health 2015) give clear indication of the negative impact of methamphetamine use in the community and the need for a strategy to address it.

Victorian health services have been directed to reduce the use of restrictive interventions for the management of aggressive and violent behaviour (Department of Health 2013). A central concept in the reduction of restrictive interventions is focusing on risk factors (Livingstone 2007). Risk factors include those specific to the individual such as clinical and socio-demographic variables (Tunde-Ayinmode & Little 2004), as well as factors specific to the mental health service (Livingstone 2007). Anecdotally, mental health clinicians in one service had noticed higher rates of restrictive interventions for consumers who use methamphetamine. Therefore, the aim of this study was to describe clinical and socio-demographic variables associated with the use of restrictive interventions during acute inpatient mental health admission, with a focus on investigating the impact of recent methamphetamine use.

METHODS

Research Design

A retrospective cohort study design was used to meet the aim. Data were extracted for all consecutive acute adult mental health admissions at the study site from 1st December 2014 through to 28th February 2015. The collection of methamphetamine and other substance use and consumer socio-demographic profiles are standard procedures for new admissions. The study received ethics approval from the Melbourne Health Office for Research (QA/LNR 2014181).

Study Setting

The acute adult inpatient mental health unit has 29 beds, eight of which are in the psychiatric intensive care area (ICA). The unit provides multidisciplinary acute specialist clinical care for

consumers admitted with serious mental illness. The unit is located on the campus of a metropolitan hospital with an ED which accounts for approximately 70% of all admissions. Compared with Victorian census data, the locale of the unit is characterised by low socio-economic status, high ethnic and linguistic diversity, and high unemployment (ABS 2013).

Data Collection

A de-identified electronic clinical database was retrospectively interrogated by nurse researchers for consecutive admissions at the unit across the three-month data collection period. A data collection tool was used to capture clinical and socio-demographic variables known to be associated with the use of restrictive interventions (Bullock et al. 2014; Chen et al. 2015). Additionally, the frequency and duration of each type of restrictive intervention during a consumer's admission was collected. A composite variable was generated for use of any restrictive interventions (i.e., seclusion or restraint) at any time during the consumer's inpatient admission.

Methamphetamine use/screening

Upon admission, each consumer was asked to self-report any recent substance use and to consent to a voluntary saliva drug screening test (DrugWipe[®] 5 S, Securetec Detektions-Systeme, Germany). The device screened for recent use of methamphetamine, cannabis, cocaine, and opiates. Methamphetamine use was determined based on self-report about recent use (<24 hours) and/or confirmation with a positive saliva drug screen.

Data Analysis

Data were entered and analysed using the Statistical Package for Social Scientists 21.0 for Windows [IBM Corp, Armonk, USA]. Chi-square analyses were computed to identify socio-demographic, contextual, and clinical variables associated with the use of restrictive interventions in the inpatient unit. Subject to clinical judgment and theoretical rationale, socio-demographic, contextual, and clinical variables associated with restrictive interventions (i.e., $p \leq 0.05$) were considered for inclusion in a multivariate forward stepwise logistic regression. Rigor of the model was confirmed with backward stepwise logistic regression and through

computation of diagnostic and residual statistics. Significance of the two-tailed model was accepted at $p \leq 0.05$.

RESULTS

Sample description

There were 232 consecutive admissions to the inpatient unit, of which, 23 (9.9%) refused to consent to saliva screening. Refusal rates were higher among those who used methamphetamine (16% vs 8%, $p=0.059$) and higher among consumers who were subject to restrictive interventions (24% vs 8%, $p=0.013$). Fifty-two percent of admissions were males (see table 1). The age range of all admissions was 18 to 68 years and 83% of all admissions were unemployed (see table 1). A total of 199 (86.1%) admissions were assessed as at risk of harm to self or others and 74.1% has a history of mental health hospitalization (see table 1). Ten percent of admissions experienced a restrictive intervention in an ED prior to admission and 30% had previously been subject to a restrictive intervention (see table 1).

Table 1 about here

Methamphetamine use

A total of 71 (30.6%) people self-reported or were saliva screened as positive for methamphetamine use (see Table 1). There was no difference among gender for those people who used methamphetamine and those who did not. Those people who used methamphetamine users were younger and more likely to; (1) be not in paid employment, (2) speak English as a second language, (3) be admitted under mental health legislation, (4) have a past history of mental health hospitalisation, (5) have a diagnosis of a psychotic illness, (6) a diagnosis of an alcohol or substance use disorder, (7) were at risk of withdrawal, and (8) involvement with police prior to inpatient admission. There was no difference in the risk of harm to self or others

at admission to the inpatient unit among people who used methamphetamine and those who did not (see Table 1).

The concurrent use of methamphetamine and other substances was common. Cannabis (57.7%) and heroin/opiates (25.4%) were used with methamphetamine (see table 2). Fifty percent of consumers did not use methamphetamine or any other substance and 53 (32.9%) used alcohol only (see table 2).

Table 2 about here

Restrictive interventions

Across the three months, restrictive interventions in the acute adult inpatient mental health unit were used with 25 people (see table 1). The use of restrictive intervention in the unit was uncommon and 73.2% of people who used methamphetamine did not experience a restrictive intervention. Most consumers that received a restrictive intervention (n=18 of 25) were subject to either mechanical or physical restraint combined with the use of seclusion during their admission. As such, there were 23 episodes of seclusion, 20 episodes of physical restraint, and 1 episode of mechanical restraint. Consumers subjected to restrictive interventions were more likely to have a psychotic illness as their primary diagnosis (72.7%), have ever had previous experience with restrictive interventions (68.8%), and had experienced a restrictive intervention in the ED prior to admission (52.4%) (see Table 3).

Table 3 about here

Model development

Socio-demographic, contextual, and clinical variables included in the model are shown in table 3. After adjusting for confounding variables, the independent predictors of the use of restrictive interventions in the inpatient unit were people who used methamphetamine (OR 7.83) and the use of a restrictive intervention in the ED prior to admission (OR 8.85).

DISCUSSION

This study revealed the rate of community-based methamphetamine use prior to admission to an acute inpatient mental health unit (30.6%) was substantially higher than the national community-based rate of 2% (AIHW 2014). Furthermore, the study demonstrated the impact of methamphetamine and subsequent use of restrictive interventions in an acute inpatient mental unit. Specifically, confounding for socio-demographic, contextual, and clinical variables, methamphetamine use and the use of a restrictive intervention in an ED prior to admission were the greatest predictors of the subsequent use of restrictive interventions in an acute inpatient mental health unit.

The management of consumers exhibiting aggression and violence presents a regular challenge for staff working in mental health inpatient units (Cornaggia et al. 2011; Iozzino et al. 2015). Typically, mental health services have managed aggressive and violent behaviour through the use of force and restrictive interventions (Cole 2014). However, there has been a national (Department of Health 2013) and international (Knox & Holloman Jr 2012; NICE 2015) refocus on reducing or eliminating the use of coercive practices with greater emphasis on non-restrictive strategies aimed at de-escalation (Department of Health 2013). Results of the current study support the known additional demand placed on ED resources to manage aggressive and violent behaviour of people presenting with methamphetamine intoxication (Bunting et al. 2007) compared with other substance use presentations.

The identified association among the use of methamphetamine, restrictive interventions in an ED, and subsequent use of restrictive interventions in an acute mental health inpatient unit in the current study may be attributed to several contextual factors. For people in mental health crisis, extended ED waiting time (Kalucy et al. 2005) and inappropriate triage priority (Sands et al. 2012) are known to escalate violent and aggressive behaviour and result in the use of restrictive interventions (Downey et al. 2007; Jelinek et al. 2013). Emergency department clinicians are known to have limited opportunity to introduce non-restrictive de-escalation interventions (Cole 2014). In the current study, the added challenge of people presenting with methamphetamine

intoxication or withdrawal, was a challenge to reduce the use of restrictive intentions, despite the notion that the use of such should only be as a last resort (D'Orio et al. 2004).

Greater staff exposure to and training in less restrictive alternatives has been shown to reduce reliance on restrictive interventions in EDs and enhance a culture of non-coercive practices (Cole 2014). The results of the current study indicate that clinicians in an inpatient mental health setting need to develop means to provide care with the least restrictive alternatives to consumers who use methamphetamine. While the busy, high acuity environment of an acute inpatient mental health unit may negate the total elimination of restrictive interventions, the results of the current study highlight the need to strive towards a non-restrictive and smooth transition for people experiencing a mental health crisis who require hospitalization following presentation to an ED. A future research priority should be to explore and describe the effective use of less restrictive alternatives with those people presenting to acute inpatient mental health services following methamphetamine use and transition through an ED.

Limitations

The current study was limited to retrospective collection of data rather than a prospective account of methamphetamine use and restrictive interventions. As such, a comparison among other time periods to determine trends in the use of restrictive interventions was not possible. A further limitation was that methamphetamine use was based on self-report and saliva screening rather than toxicological assessment. Furthermore, the specificity and sensitivity of the saliva screening tool is unknown. Also, a delay in screening (i.e., time from ingestion to screening) could have resulted in lower detection rates. Clinicians were aware of the outcome of self-report and saliva screening. However, the research design of the study did not allow discussion of how such knowledge may have impacted on clinical treatment and/or restrictive interventions.

Although a high proportion of restrictive interventions were associated with methamphetamine use, the results of the current study show that violent and aggressive behaviour can be managed with less restrictive alternatives to seclusion, physical restraint, and/or mechanical restraint as only 26.8% of methamphetamine users experienced a restrictive intervention during admission.

However, an inability to document and describe the use of less restrictive interventions in the ED and after inpatient mental health admission was another limitation of the current study.

CONCLUSIONS

Mental health consumers who had recently used methamphetamine or been subject to restrictive intervention in an ED were more likely to be subject to the use of restrictive interventions when admitted to an acute inpatient mental health unit. This study reinforces the need to strive toward less restrictive practices for mental health crisis. This may be supported by a better understanding of de-escalation and non-restrictive management strategies of those affected by methamphetamine, a significant correlate with this problem.

Relevance for clinical practice

Mental health clinicians practicing in acute inpatient units can translate the results of the current study into their clinical practice in several ways. As consumers admitted with self-reported or positive saliva screen for recent methamphetamine use are more likely to require the use of restrictive interventions to manage violent and aggressive behaviour than consumers using any substance, clinicians can begin to create and implement targeted de-escalation interventions for that cohort. Given the high prevalence of methamphetamine use found in the current study, clinicians may begin to profile methamphetamine use relative to intoxication or withdrawal and begin to develop management strategies for consumers based on the presenting symptoms. Such a process may enable specific and/or tailored de-escalation strategies and interventions based on a consumer's methamphetamine intoxication or withdrawal.

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Table 1. Sample descriptors and methamphetamine use

		Total n (col %)	Methamphetamine use		
			Yes n (col %)	No n (col %)	p - value
Total N (row %)		232	71 (30.6)	161 (69.4)	
Socio-demographic Variables					
Gender	Male	120 (52.2)	43 (60.6)	77 (48.4)	0.09
	Female	110 (47.8)	28 (39.4)	82 (51.6)	
	Missing	2		2	
Age (years)	Mean (SD)	34.8 (10.0)	31.8 (7.5)	36.1 (10.7)	0.001
	Range	18 - 68	19 - 50	18 - 68	
Educated to year 12	Yes	123 (83.7)	29 (27.5)	94 (12.1)	0.03
	No	24 (16.3)	11 (72.5)	13 (87.9)	
	Missing	85			
English as secondary language	Yes	48 (21.0)	21 (30.4)	27 (16.9)	0.02
	No	181 (79.0)	48 (69.6)	133 (83.1)	
	Missing	3			
Employment status	Paid	38 (17.0)	5 (7.8)	33 (20.8)	0.02
	Unpaid	185 (83.0)	59 (92.2)	126 (79.2)	
	Missing	9	7	2	
Clinical Variables					
*Diagnosis of a psychotic illness	Yes	91 (47.2)	43 (66.2)	48 (37.5)	<0.001
	No	102 (52.8)	22 (33.8)	80 (62.5)	
	Missing	39	6	33	
*Diagnosis of alcohol/substance use disorder	Yes	126 (55.8)	66 (93.0)	60 (38.7)	<0.001
	No	100 (44.2)	5 (7.0)	95 (61.3)	
	Missing	6		6	
Alcohol/substance withdrawal on admission	Yes	109 (50.9)	59 (89.4)	50 (33.8)	<0.001
	No	105 (49.1)	7 (10.6)	98 (66.2)	
	Missing	18	5	13	
Risk of harm to self or others	Yes	199 (86.1)	63 (90.0)	136 (84.5)	0.26

	No	32 (13.9)	7 (10.0)	25 (15.5)	
	Missing	1	1		
Involuntary admission	Yes	122 (52.6)	53 (74.6)	69 (42.9)	<0.001
	No	110 (47.4)	18 (25.4)	92 (57.1)	
History of mental health hospitalisation	Yes	166 (74.1)	57 (83.8)	109 (69.9)	0.03
	No	58 (25.9)	11 (16.2)	47 (30.1)	
	Missing	8	3	5	
Contextual Variables					
ED use of restrictive intervention	Yes	22 (10.0)	17 (26.6)	5 (3.2)	<0.001
	No	198 (90.0)	47 (73.4)	151 (96.8)	
	Missing	12	7	5	
History of restrictive intervention	Yes	48 (30.0)	22 (46.8)	26 (23.0)	0.003
	No	112 (70.0)	25 (53.2)	87 (77.0)	
	Missing	72	24	48	
Involvement of police	Yes	77 (35.0)	39 (59.1)	38 (24.7)	<0.001
	No	143 (65.0)	27 (40.9)	116 (75.3)	
	Missing	12	5	7	
Restrictive Intervention					
RI used	Yes	25 (10.8)	19 (26.8)	6 (3.7)	<0.001
	No	207 (89.2)	52 (73.2)	155 (96.3)	

*DSM-V classification.

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Table 2: Multiple responses for concurrent methamphetamine and substance use

	Total			Yes		No
	N	Column N %	n	Column n %	n	Column n %
Total	232	100.0	71	100.0	161	100.0
Alcohol	67	28.9	14	19.7	53	32.9
Benzodiazepines	25	10.8	5	7.0	20	12.4
Cannabis	72	31.0	41	57.7	31	19.3
Cocaine	5	2.2	4	5.6	1	0.6
Heroin/Opiates	32	13.8	18	25.4	14	8.7
Nicotine	61	26.2	25	35.2	36	22.4
Total any substance use	150	64.7	71	100.0	79	49.1
Total no substance use	82	35.3	n/a	n/a	82	50.9

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Table 3: Predictors of restrictive intervention in an acute adult inpatient unit

	Total N (col valid %)	Restrictive intervention		Unadjusted		Adjusted	
		Yes n (col valid %)	No n (col valid %)	OR	95% CI	OR	95% CI
Total n (row %)	232	25 (10.8)	207 (89.2)				
Significant Predictors							
Police involved	77 (33.2)	13 (59.1)	64 (32.3)	3.02	1.23 - 7.44		
Psychotic illness	91 (39.2)	16 (72.7)	75 (43.9)	3.41	1.27 - 9.15		
Methamphetamine use	71 (30.6)	19 (76.0)	52 (25.1)	9.44	3.58 - 24.90	7.83	2.33 - 26.31
Cannabis use	72 (31.0)	15 (60.0)	57 (27.5)	3.95	1.68 - 9.29		
History of RI	48 (20.7)	11 (68.8)	37 (25.7)	6.36	2.07 - 19.52		
RI used in ED	22 (9.5)	11 (52.4)	11 (5.5)	18.80	6.58 - 53.74	8.85	2.83 - 27.70

CI = Confidence interval; ED = Emergency department; RI = Restrictive intervention

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Title:

Association of methamphetamine use and restrictive interventions in an acute adult inpatient mental health unit: A retrospective cohort study

Date:

2017-02-01

Citation:

McKenna, B., McEvedy, S., Kelly, K., Long, B., Anderson, J., Dalzell, E., Maguire, T., Tacey, M. & Furness, T. (2017). Association of methamphetamine use and restrictive interventions in an acute adult inpatient mental health unit: A retrospective cohort study. *INTERNATIONAL JOURNAL OF MENTAL HEALTH NURSING*, 26 (1), pp.49-55. <https://doi.org/10.1111/inm.12283>.

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