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Monitoring and predicting the risk of violence in residential facilities. No difference between patients with history or with no history of violence



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ABSTRACT

Background: Most people with mental disorders are not violent. However, the lack of specific studies in this area and recent radical changes in Italy, including the closure of six Forensic Mental Hospitals, has prompted a more detailed investigation of patients with aggressive behaviour.

Aims: To compare socio-demographic, clinical and treatment-related characteristics of long-term inpatients with a lifetime history of serious violence with controls; to identify predictors of verbal and physical aggressive behaviour during 1-year follow-up.

Methods: In a prospective cohort study, patients living in Residential Facilities (RFs) with a lifetime history of serious violence were assessed with a large set of standardized instruments and compared to patients with no violent history. Patients were evaluated bi-monthly with MOAS in order to monitor any aggressive behaviour.

Results: The sample included 139 inpatients, 82 violent and 57 control subjects; most patients were male. The bi-monthly monitoring during the 1-year follow-up did not show any statistically significant differences in aggressive behaviour rates between the two groups. The subscale explaining most of the MOAS total score was aggression against objects, although verbal aggression was the most common pattern. Furthermore, verbal aggression was significantly associated with aggression against objects and physical aggression.

Conclusions: Patients with a history of violence in RFs, where treatment and clinical supervision are available, do not show higher rates of aggressiveness compared to patients with no lifetime history of violence. Since verbal aggression is associated with more severe forms of aggression, prompt intervention is warranted to reduce the risk of escalation.

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1. Introduction

The risk of violence posed by patients with severe mental disorders has long been a hot topic. In the general population, the attributable risk due to mental disorders is small compared to other risks of violence. By using population registers, Fazel and Grann (2006) found the population attributable risk fraction of severe mental illness on violent criminality to be no more than 5%. In other words, mental illness is a limited source of violence in the community. However, violence committed by people suffering from mental disorders tends to gain disproportionate media coverage, creating an exaggerated sense of personal risk (Arboleda-Florez, 2009), and this underlines the need for proper management of patients at risk of violent behaviour.

In Italy there have been six Forensic Mental Hospitals (FMHs) with a total population of around 1400 individuals. Recent laws (n. 9/2012 and 81/2014) set the deadline of 31 March 2015 for the gradual discharge of all patients from FMHs and their relocation to special high-security units, with no more than 20 beds each. In addition, many patients at lower risk of reoffending, will be cared for by ordinary Mental Health Departments (DMHs). This change will involve increasing legal responsibility of both individual psychiatrists and DMHs and will also require a substantial organizational change for Mental Health Services compared to the past.

Given this radical change and given the paucity of Italian studies in this area, we set up a specific study aimed to verify whether psychiatric patients with a history of violence and living in Residential Facilities (RFs) are really more aggressive than inpatients with no history of violence. Our main aims were: (a) to assess the socio-demographic, clinical and treatment-related characteristics of patients living in RFs with a lifetime history of interpersonal violence, and compare them with controls with no history of violence; (b) to find predictors of aggressive and violent behaviour in patients assessed bi-monthly with the Modified Overt Aggression Scale (MOAS) over a 1-year follow-up.

2. Materials and methods

2.1. Study design

This prospective cohort study involved patients living in different RFs in four sites (Cernusco, Pavia, Brescia and Turin) in Northern Italy. All patients with a history of severe interpersonal violence (named 'violent patients'), living in these RFs in the index period May–September 2013, were recruited by treating clinicians. Furthermore, patients with no history of violence, similar by age, gender and primary diagnosis (including co-morbidity with substance or alcohol addiction), were identified as a control group.

2.2. Patient inclusion and exclusion criteria

Violent patients had to meet one or more of the following criteria: (i) to be admitted at least once to a FMH for any violent acts against people; (ii) to be arrested at least once for any violent act against people; (iii) to have a documented lifetime history of violent acts against people (as reported in the official clinical records). The control group included patients who did not meet any of these three conditions. Exclusion criteria were being older than 65 years and having a primary diagnosis of organic mental disorder. The study was approved by the relevant Ethics Committees and all participants provided written informed consent.

2.3. Baseline assessment

A Patient Schedule addressing socio-demographic characteristics,

social relationships, leisure activities, socioeconomic status, clinical and treatment-related features, plus a specific section (only for violent patients) concerning their history of violence was filled in for each patient recruited. The SCID-I and SCID-II (First et al., 2002, 1997) were administered in order to confirm clinical diagnoses.

Psychopathology and psychosocial functioning were assessed by the following: the Brief Psychiatric Rating Scale (BPRS) (Ventura et al., 1993), the Personal and Social Performance (PSP) scale, a modified version of the DSM-IV Social and Occupational Functioning Assessment Scale (SOFAS) (Morosini et al., 2000) and the Specific Levels Of Functioning (SLOF) (Harvey et al., 2011).

Aggression and impulsivity were evaluated by the following instruments: (a) the Brown-Goodwin Lifetime History of Aggression (BGLHA), an 11-item questionnaire assessing lifetime aggressive behaviour across 2 stages of life (adolescence and adulthood) by directly aiming how many times the aggressive behaviour occurred for each item (Brown et al., 1979); (b) the Buss-Durkee Hostility Inventory (BDHI), a 75-item questionnaire developed to assess 8 subscales related to hostility and negative affect (Buss and Durkee, 1957); (c) the Barratt Impulsiveness Scale (BIS-11), a 30-item, 4-point Likert scale questionnaire that investigates personality and behavioral impulsiveness, with scores ranging from 30 to 120 (Barratt, 1965); (d) the State-Trait Anger Expression Inventory 2 (STAXI-2), which includes six scales plus an Anger Expression Index, an overall measure of total anger expression (Spielberger et al., 1985).

Patients' insight was assessed by the Insight scale (Marková et al., 2003), which provides a total score ranging from 0 (no insight) to 30 (full insight).

All research assistants underwent centralised instrument administration- and rating training conducted by clinicians with a specific experience in this area.

2.4. Bi-monthly monitoring of violent behaviour

Every two weeks, during the 1-year follow-up after the baseline assessment, the treating clinician or the patient's case manager filled in the MOAS (Margari et al., 2005) for each patient involved in the study. All assessors were very familiar with patients and had daily contact with them. The MOAS included 4 subscales of aggression: verbal, physical, against objectives and self-harm behaviour. Here, we focused only on the first three subscales. A score from 0 to 4 is assigned to each act: 0 indicating no aggressive behaviour and higher scores increasing severity. The score in each category is multiplied by a factor assigned to that category; 1 for verbal aggression, 2 for aggression against objects, 3 for aggression against self and 4 for aggression against other people. So, the total weighted score ranges from 0 (no aggression) to 40 (maximum grade of aggression). We will subsequently refer to the weighted MOAS score simply as the MOAS score.

2.5. One-year follow-up

Changes in the patients' clinical and psycho-social conditions were re-evaluated with the BPRS and PSP. For patients discharged to other accommodations or discharged home during follow-up, the researchers contacted their treating psychiatrist and asked him/her to fill in the MOAS fortnightly.

2.6. Statistical analyses

Categorical data were analysed in inter-group comparisons with χ^2 , or Fisher's exact test, when appropriate ($n < 5$ in any cell in binary comparison). The Cramer values were reported as association index. Student t-test was used to compare quantitative

variables. The accordance between categorical variables, clinicians' prediction and home discharge were quantified using Cohen's kappa co-efficient. Non parametric tests were used for comparing non-Gaussian variables.

Monitoring of violent behaviour was performed by analysing the MOAS total score and MOAS subscales along all the 24 time-points during follow-up. Considering the non-Gaussian (skewed and zero-inflated) distribution of MOAS score, generalized estimating equation (GEE) models with tweedie distribution and log-link function were adopted to analyse MOAS repeated measures. Similarly, the relation between the total scores of MOAS subscales (mean across the 24 time-points) were investigated by generalized linear models with tweedie distributions. Goodness of fit of the models were evaluated by Akaike information index (AIC: the lower index value, the better the model fit). Finally, an analysis of predictors of violent behaviour was carried out through generalized linear models (with tweedie distribution and log-link function) with the MOAS mean total score as a dependent variable, and continuous and categorical measures as independent variables.

All tests were two-tailed, with statistically significant level set at $p = 0.05$. All data were coded and analysed using the Statistical Package for Social Science (SPSS, version 21) for Windows (Chicago, Illinois 60,606, USA), and R: A language and environment for statistical computing, (R Core Team, 2015), R Foundation for Statistical Computing, Vienna, Austria.

3. Results

A total of 139 inpatients with a primary diagnosis of mental disorders met the study entry criteria: 82 had a lifetime history of severe aggression against people (violent patients) and 57 were controls. Another 10 patients were contacted, but refused to participate in the study (7 with a history of violence). The mean age of the violent patients was 44.9 years (SD = 11.4) compared to 46.7 (SD = 9.5) for the controls.

With regard to RF characteristics and restrictiveness, they have similar features in terms of coverage by medical staff (24-h cover), number of beds (generally, each RF hosts up to 20 patients, with two patients in each room), and the average number of treating staff (i.e. psychiatrists, nurses, vocational therapists). When we controlled for all environmental and staff characteristics, no differences were found between different sites; in particular, with regard to the average number of treating staff per RF, there were no between-site differences (Cernusco: 9.1 ± 2.0 average number of staff; Pavia: 10.5 ± 1.5 ; Brescia: 8.3 ± 1.5 ; Turin: 11.5 ± 2.3 ; $p = 0.079$). In all RFs patients were free to get out during the daytime, upon agreement with the staff.

3.1. The sample's socio-demographic characteristics

More patients in the violent group (38.3%) were employed as compared to controls (19.6%; $\chi^2 = 0.445$, $p = 0.020$). As expected, 51.2% of violent patients were admitted to the RF from a prison or a FMH, compared to none in the control group ($\chi^2 = 0.618$, $p = 0.001$) (see Table 1).

Table 2 shows the clinical and treatment-related characteristics of the two groups.

The most common primary diagnosis was schizophrenia, with a lifetime history of alcohol abuse. There was also a relevant proportion of patients meeting criteria for personality disorders and the difference between the two groups was statistically significant: 79.3% in the violent group versus 63.2% in the control ($\chi^2 = 4.39$, $p = 0.036$).

No significant difference (Mann-Whitney $p = 0.221$) between groups was detected in terms of length of stay in RF: 840 days

(median = 314) for violent patients, and 897 days (median = 484) for the control group.

3.2. Clinicians' prediction

Clinicians were also asked to predict the patient's setting of care at the end of the 1-year follow-up. Surprisingly, treating clinicians predicted a higher percentage of patients discharged home in the violent group compared to control patients (respectively 23.2% compared to 8.8%; V Cramer = 0.315, $p = 0.002$). Indeed, during the 1-year follow-up there was a higher percentage of home discharges among violent patients (44.4% versus 30.8% among the controls). We then analysed the concordance between clinicians' predictions and real home discharge of each patient and we found a moderate concordance (Cohen's K = 0.52, $p < 0.001$). In particular, clinicians' predictions were more accurate for patients not discharged home (108 patients were not discharged home versus 115 predicted, with a 93.9% of agreement). On the contrary, the agreement was considerably lower for predictions of home discharge (13 patients were discharged home versus 24 predicted, with 54.2% agreement).

3.3. Aggressiveness and impulsivity

Table 3 shows the group comparisons on assessment of aggressive and impulsive behaviour.

Concerning the BGLHA, there was a statistically significant difference between the two groups, indicating a more severe history of lifetime aggressive behaviour in violent patients during adolescence and adulthood. For the BDHI and the STAXI-2, there were few statistically significant differences in ratings.

3.4. Sample's clinical characteristics

Table 4 shows the group comparisons in psychopathology and psychosocial functioning.

At baseline, there were no differences in the mean BPRS total score between the two groups. A statistically significant difference was found only for the withdrawal subscale (mean score: 11.0, SD = 5.0 for the controls versus 8.4, SD = 4.3 for the violent patients; $p = 0.001$), which includes 'emotional withdrawal', 'motor retardation' and 'blunted affect', with higher scores pointing to a higher level of symptomatology. Violent patients were also characterized by a higher level of psycho-social functioning (PSP mean score = 44.5, SD = 17.3) than controls (PSP mean score = 38.5, SD = 15.0, $p = 0.037$). On the contrary, there were no statistically significant group differences regarding the SLOF, although subjects with a history of violence reported higher scores on almost all SLOF domains. With regard to patients' insight, our results did not show any differences between the two groups. The mean total score for the violent group was 12.3 (SD = 6.9) as compared to 13.6 (SD = 7.1) for the control group.

3.5. Psychotropic medications

At baseline, 94.2% patients were on psychotropic medication, although for 8 (5.8%) subjects these data were missing. For all drug classes (antipsychotic drugs, mood stabilizers, benzodiazepines), there were no statistically significant differences between the two groups. The percentage of violent patients (36.6%) receiving mood stabilizers was similar to that of the control group (35.1%, $p = 0.856$). Similarly, 51.2% of violent patients were receiving two or more anti-psychotics compared to 40.4% of the control group ($p = 0.172$) and 23.7% of violent patients were receiving two or more benzodiazepines compared to 38.2% of controls ($p = 0.181$).

Table 1
Sociodemographic characteristics of violent patients and controls at baseline.

	Violent patients (N = 82) N (%)	Controls (N = 57) N (%)	Test ^a	p-value
Gender				
Male	74 (90.2)	47 (82.5)	0.114	0.179
Female	8 (9.8)	10 (17.5)		
Nationality				
Italian	76 (92.7)	56 (98.2)	0.122	0.150
Others	6 (7.3)	1 (1.8)		
Age				
18–33	11 (13.4)	5 (8.8)	0.09	0.558
34–49	38 (46.3)	31 (54.4)		
50–64	33 (40.2)	21 (36.8)		
Marital status				
Married or cohabiting	5 (6.1)	3 (5.3)	0.201	0.232
Single	77 (93.9)	54 (94.7)		
Education				
Low level	67 (81.7)	45 (79.0)	0.165	0.584
Medium-high level	15 (18.3)	12 (21.0)		
Occupation				
Employed	31 (38.3)	11 (19.6)	0.445	0.020
Unemployed	50 (61.7)	45 (80.4)		
Admission source				
From home	11 (13.4)	19 (33.3)	0.618	0.001
From a FMH	22 (26.8)	0 (0.0)		
From a prison	20 (24.4)	0 (0.0)		
Other RF	29 (35.4)	38 (66.7)		
Economic independence				
Yes	13 (15.9)	15 (26.3)	0.128	0.130
No	69 (84.1)	42 (73.7)		
Social relationships				
Yes	59 (72.0)	43 (75.4)	0.039	0.647
No	23 (28.0)	14 (24.6)		
Time spent doing nothing				
Less than 6 h per day	22 (26.8)	24 (42.1)	0.161	0.165
More than 6 h per day	60 (73.2)	33 (57.9)		

^a Standardized value of V Cramer.

3.6. Follow-up clinical assessment

At 1-year follow-up, the level of psychopathology was stable, as shown by the BPRS scores, which changed only marginally. There was only a statistically significant difference between the two groups in the withdrawal subscale, already recorded at baseline. Similar considerations were applicable to the PSP (see Table 4).

3.7. Aggressive and violent behaviour during the 1-year follow-up

With regard to the monitoring of MOAS total scores during the 1-year follow-up, there were no statistically significant differences between the mean across time of the two groups (mean = 0.5, SD = 0.8, median = 0.2 for violent group and mean = 0.3, SD = 0.7 and median = 0 for controls). We did observe some differences between the two groups which, however, were not statistically significant (Fig. 1). In particular, violent patients showed higher weighted total scores in the first four months (8 time-points). In order to understand this result more in detail, we analysed weighted total scores for each of the four study sites (Fig. 1s). There were two sites (Cernusco and Pavia) with many episodes of aggressive behaviour among violent patients and almost none in the control sample. Differently, in the other two sites (Brescia and Turin), there were no evidence of differences between the two groups (neither in Brescia site where the difference observed in the first four months was no significant).

The most common aggressive behaviour displayed by patients was verbal aggression: 54% of patients were verbally aggressive at least once during the 1-year follow-up, compared with 25.9% of patients scoring ≥ 1 for aggression against objects, and 19.4% for inter-personal violence. However, if we consider the scores for the

different subscales, no significant differences were detected between the two groups, basically due to the large amount of variability within group scores (Fig. 2).

Similarly, no statistically significant difference emerged when comparing violent patients discharged at home versus violent patients not discharged or versus controls (Fig. 2s).

3.8. Relationship between different types of aggression and violence

Generalized linear models performed to analyse the relationship between MOAS subscales (mean of unweighted scores across follow-up time) showed that the subscale which explained to a larger extent the MOAS total score variability was aggression against objects (standardized beta coefficient = 1.39, AIC = 653), followed by physical and verbal aggression (respectively with beta = 1.35, AIC = 681; beta = 1.15, AIC = 698).

With regard to the relationship between the three subscales, verbal aggression was a significant predictor of aggression against objects (beta = 1.20, $p < 0.001$) and of physical aggression (beta = 1.18, $p < 0.001$, with AIC indexes of 250 and 300 respectively), while aggression against objects was a significant predictor (beta = 1.51, $p < 0.001$) of interpersonal violence (AIC = 244).

3.9. Predictors of violent behaviour during the 1-year follow-up

In order to identify occurrence predictors of new episodes of violence during follow-up, we considered variables shown in previous studies to be associated to the risk of violence, such as gender, education, occupation, diagnosis of schizophrenia, functioning, substance use and lifetime history of violence (Iozzino et al., 2015). We also included variables that we found associated with the

Table 2
Clinical and treatment-related characteristics of violent patients and controls.

	Violent (N = 82) N (%)	Controls N = 57 N (%)	Test ^a	p-value
Illness duration (Years) (mean, SD)	20.1 (±10.5)	23.3 (±10.2)	−1.70	0.092
Age of first contact with DMHs (Years) (mean, SD)	28.7 (±11.4)	25.7 (±7.8)	1.504	0.135
Lifetime Compulsory Admissions				
None	9 (12.0)	17 (37.0)	0.503	0.001
1–3	60 (80.0)	39 (63.0)		
≥4	6 (8.0)	0 (0)		
Primary Diagnosis				
Schizophrenia	50 (61.0)	37 (64.9)	0.223	0.228
Personality disorder	16 (19.5)	10 (17.6)		
Other	16 (19.5)	10 (17.5)		
Meeting criteria for personality disorder				
Yes	65 (79.3)	36 (63.2)	4.39	0.036
No	17 (20.7)	21 (36.8)		
Lifetime use of Alcohol				
Yes	34 (43.6)	31 (55.4)	1.807	0.179
No	44 (56.4)	25 (44.6)		
Lifetime use of Cannabinoids				
Yes	23 (29.9)	11 (19.6)	0.116	0.182
No	54 (70.1)	45 (80.4)		
Lifetime use of Stimulants				
Yes	19 (25.0)	8 (14.3)	0.131	0.131
No	57 (75.0)	48 (85.7)		
Lifetime use of Opioids				
Yes	15 (20.3)	6 (10.7)	0.129	0.143
No	59 (79.7)	50 (89.3)		
Lifetime use of Hallucinogens				
Yes	12 (15.6)	9 (16.1)	0.003	0.974
No	63 (84.4)	48 (83.9)		
Social Support				
Available	48 (62.3)	31 (55.0)	0.120	0.572
Not available	29 (37.7)	26 (45.0)		
Appropriateness of the accommodation				
Appropriate	66 (80.5)	52 (91.2)	0.070	0.371
Inappropriate	16 (19.5)	5 (8.8)		
Clinician's prediction about the stay of the patient after 1-year				
Not discharged	37 (45.1)	37 (64.9)	0.315	0.002
Discharged to another RF	26 (31.7)	15 (26.3)		
Home discharged	19 (23.2)	5 (8.8)		
Destination of discharge				
At home	16 (44.4)	4 (30.8)	0.160	0.535
Other RF	19 (52.8)	9 (69.2)		
Prison	1 (2.8)	0 (0.0)		
Discharged during the 1 year follow-up				
No	46 (56.1)	44 (77.2)	0.210	0.013
Yes	36 (43.9)	13 (22.8)		

^a Standardized value of V Cramer, except for the first two variables where t-tests were used.

violent group (BDHI total score, BGLHA total score, and STAXI-2 anger expression-out). We defined as “new violent” a patient with a total MOAS score (sum across the 24 time-points) ≥ 3 .

Patients with a total weighted MOAS score >3 during the 1-year follow-up were 46% (N = 64) of the sample. None of the socio-demographic and clinical characteristics stood out as a significant predictor of new violent behaviour, with the only exception of PSP, providing a summary score for the level of functioning (beta coefficient = -0.54 , $p < 0.001$, indicating that a higher score in social functioning was associated with a lower total MOAS score).

4. Discussion

This work contributes to the study of the risk of violence in an era where the forensic system in Italy is undergoing radical change and the care for offenders will switch to ordinary DMHs and facilities run by them, such as RFs or high security units. Our sample can be considered representative of an average sample of patients with a history of violence treated by DMHs and living in RFs. The vast majority (80%) had committed physical assaults of medium gravity, while a minority (20%) were responsible for very severe

acts of violence, including murder or attempted murder. More than half of the sample had been referred to RFs by a FMH or by a prison. In 1/3 of cases, the victim was a family member, again highlighting the high burden suffered by family members even with regard to the risk of physical violence by the ill relative.

4.1. Patients' profiles and history of violence

In line with a previous study, these data show that patients with a past history of violence seem to have better psycho-social functioning and show a milder degree of emotional withdrawal and blunted affect compared to patient with no history of violence (Candini et al., 2015; Fioritti et al., 2006). Violent inpatients are also more likely to be employed, to meet criteria for personality disorders and to have a lifetime history of compulsory admissions; they were identified by treating clinicians as more likely to be discharged home. It might be that violent patients were admitted to RFs because of their risk of violence, whereas non-violent patients were referred because of their low functioning and poor ability to care for themselves.

Table 3
Rating scales for the assessment of aggressive and impulsive behaviour.

	Violent patients (N = 82) mean (SD)	Controls (N = 57) mean (SD)	T-statistics (p-value)
BDHI			
Assault	4.30 (2.33)	3.29 (1.97)	2.71 (0.008)
Indirect aggression	4.29 (1.90)	3.96 (1.80)	1.00 (0.319)
Irritability	5.12 (2.48)	4.41 (2.48)	1.62 (0.108)
Negativism	3.04 (1.46)	2.54 (1.57)	1.88 (0.063)
Resentment	3.49 (1.98)	3.27 (1.69)	0.71 (0.481)
Suspicion	4.86 (2.41)	4.45 (2.18)	1.02 (0.307)
Verbal aggression	6.78 (2.38)	5.89 (2.59)	2.01 (0.046)
Guilt	5.03 (2.33)	4.75 (2.24)	0.69 (0.492)
Total score	36.9 (12.3)	32.5 (11.4)	2.09 (0.039)
BIS-11			
Cognitive impulsiveness	16.07 (4.50)	17.03 (4.22)	-1.27 (0.206)
Motor impulsiveness	22.01 (4.99)	22.05 (5.51)	-0.04 (0.965)
Non-planning impulsiveness	27.97 (6.00)	28.10 (6.08)	-0.12 (0.806)
Total score	66.06 (12.25)	67.19 (13.11)	-0.51 (0.611)
STAXI-2			
State anger	18.6 (6.6)	18.8 (8.6)	-0.2 (0.854)
Feeling angry	6.7 (2.6)	6.6 (3.3)	0.1 (0.900)
Feel like expressing anger verbally	6.1 (2.4)	6.1 (2.4)	-0.7 (0.500)
Feel like expressing anger physically	5.8 (2.4)	5.8 (2.4)	0.1 (0.952)
Trait anger	17.5 (6.2)	16.6 (6.3)	0.8 (0.423)
Angry temperament	6.5 (2.4)	6.2 (2.6)	0.6 (0.556)
Angry reaction	7.7 (3.2)	7.4 (3.1)	0.6 (0.549)
Anger expression-out	15.5 (5.7)	13.1 (4.4)	2.6 (0.009)
Anger expression-in	17.8 (5.9)	16.9 (4.6)	1.0 (0.334)
Anger control-out	19.7 (5.7)	19.0 (5.1)	0.8 (0.443)
Anger control-in	22.5 (6.1)	21.5 (6.3)	1.0 (0.341)
Anger expression Index	39.1 (13.4)	37.6 (14.4)	0.6 (0.526)
BGLHA			
Total score	40.5 (13.5)	34.9 (12.0)	2.5 (0.014)

Table 4
Clinical symptoms and psychosocial functioning of violent patients and controls.

	Baseline		Follow-up	
	Violent patients mean (SD)	Controls mean (SD)	Violent patients mean (SD)	Controls mean (SD)
BPRS				
Total score	50.2 (24.2)	57.0 (19.1)	51.7 (24.7)	59.0 (18.8)
Anxiety–Depression	10.1 (4.4)	10.9 (4.0)	10.2 (4.3)	11.5 (4.0)
Hostility–Suspicion	7.5 (5.1)	7.9 (4.7)	7.5 (5.0)	8.4 (4.8)
Thinking Disorder	8.6 (4.9)	9.4 (4.2)	8.8 (4.9)	9.5 (4.6)
Withdrawal	8.4 (4.3) ^a	11.0 (5.0) ^a	8.7 (4.7) ^b	11.4 (4.8) ^b
Activity	6.3 (3.0)	6.3 (2.5)	6.5 (3.0)	6.3 (2.6)
PSP				
	44.5 (17.3) ^a	38.5 (15.0) ^a	46.5 (19.1)	40.8 (16.2)
SLOF				
Physical functioning	4.8 (0.4)	4.7 (0.4)	–	–
Self-care	4.3 (0.8)	4.0 (1.1)	–	–
Interpersonal relationships	3.5 (0.8)	3.3 (0.8)	–	–
Social acceptability/adjustment	4.0 (1.1)	4.2 (1.2)	–	–
Activities	3.8 (1.0)	3.7 (1.0)	–	–
Work skills	3.2 (1.1)	2.8 (1.1)	–	–

^a Statistically significant differences ($p < 0.05$) between violent and control patients at the same timepoint (baseline).

^b Statistically significant differences ($p < 0.01$) between violent and control patients at the same timepoint (follow-up).

4.2. Impulsiveness and aggressiveness

The two groups showed very small differences in the ratings of specific scales suited for the assessment of aggressive and impulsive behaviour, and anger. This result might suggest that prolonged exposure to treatment, including active psychopharmacological and psychosocial treatment with an average length of two and a half years (corresponding to the time spent in RFs; for many patients this time was longer), can modify certain behavioral dimensions explored by these scales and cancel out differences, which may have been visible before the start of this treatment.

Nevertheless, the results obtained in these scales are very

similar to those of other studies, which have investigated violent behaviour in clinical populations. Our sample's scores are similar to those found in people with personality disorders and in other psychiatric patients (Fossati et al., 2015), but are higher than the average score found in a sample of patients with schizophrenia (Troisi, 2011). However, the BIS-11 total score collected in our study in both groups is much higher than that of healthy controls, who recently reported scores ranging between 37.9 and 42.9 (Reddy et al., 2014; Zhornitsky et al., 2012).

Concerning the history of aggressive behaviour assessed by BGLHA, mean scores were comparable to those of male prisoners in the control group (Bevilacqua et al., 2012; Carli et al., 2010;

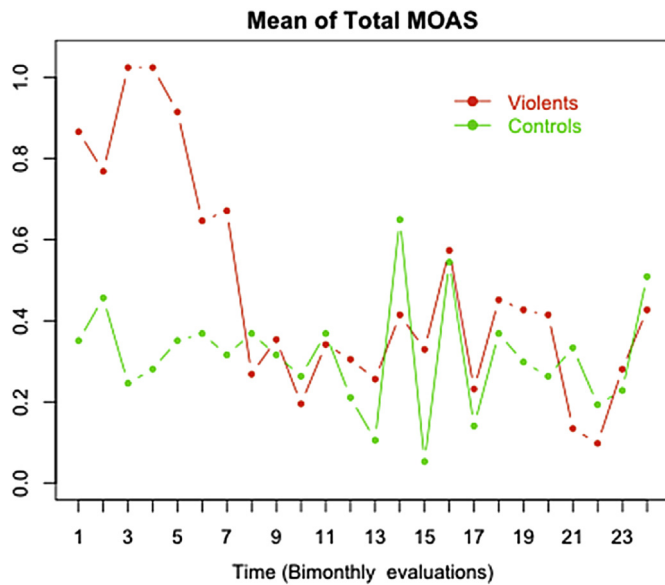


Fig. 1. Total weighted MOAS scores during the 1-year follow-up. This figure represents the trend of aggressive behaviour observed by MOAS in the two groups: violent and controls.

Gorodetsky et al., 2014), while mean scores of the violent group were higher than male prisoners. With regard to the BDHI, the

mean scores in the control group were similar to those found in psychiatric inpatients (Dell'Osso et al., 2013), while the violent group scored similar to male prisoners (Carli et al., 2010). Finally, STAXI-2 mean scores of violent and control groups overlapped with mean scores found in the general population sample enrolled for the Italian validation study (Comunian, 2004).

4.3. Are patients with a history of violence and living in RFs more likely to commit violent acts?

Our bi-monthly monitoring with MOAS showed that there were no marked differences between violent and control patients treated in RFs in the rate of aggressive and violent behaviour during the 1-year follow-up. Only in the first four months of monitoring did patients with a history of violence show higher scores in verbal aggression. It should be highlighted that adherence to drug treatment (and to psychosocial treatment as well) was ensured for all patients, living in RFs with a 24-h cover. However, violent behaviour was displayed differently in the four sites where the study took place, although these centers were homogeneous from an organizational point of view, and were caring for a very similar casemix of long-stay residential patients. For this reason, the detected differences may be considered due to chance.

4.4. What predicts violence?

The only (weak) predictor of occurrence of new episodes of aggressive behaviour in our study was a lower PSP score, providing

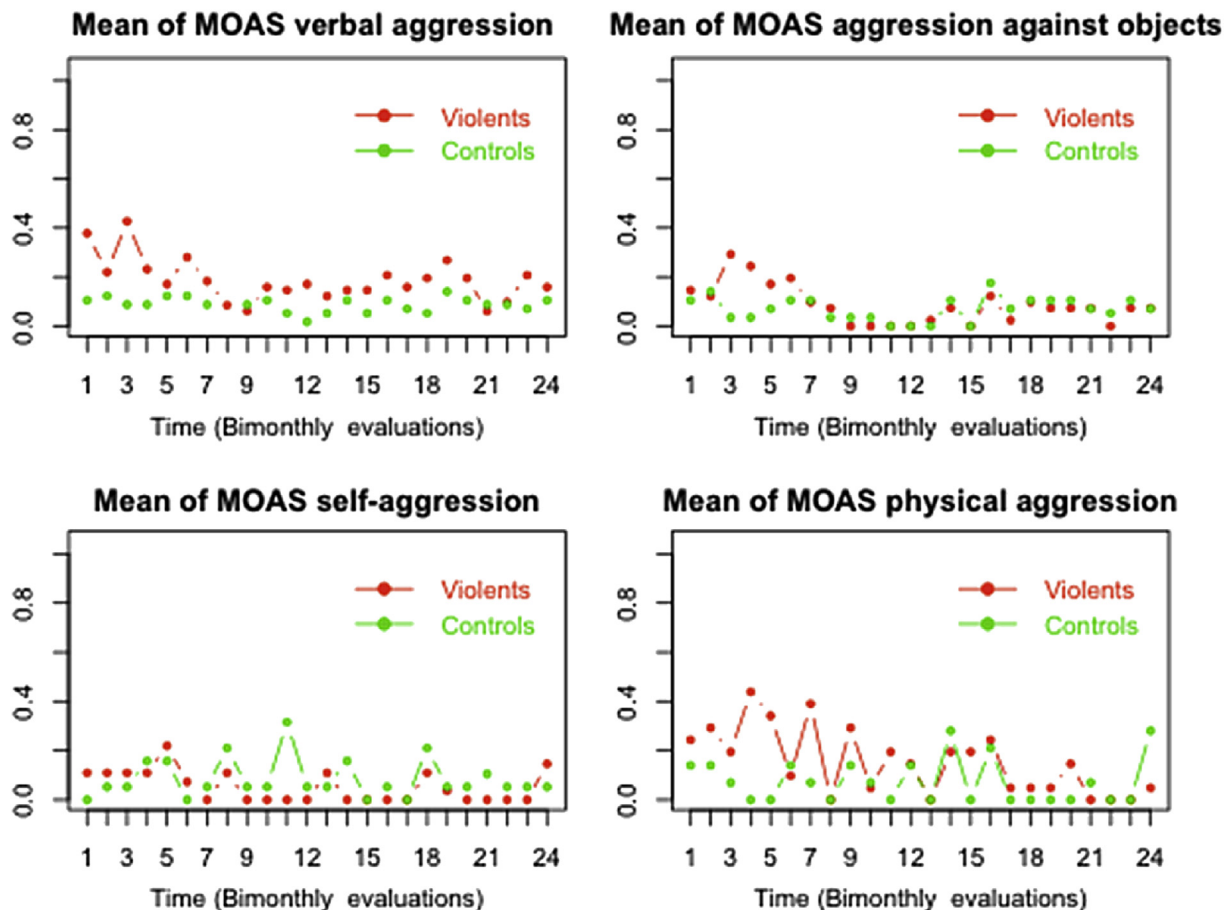


Fig. 2. Weighted MOAS scores for the four MOAS subscales during the 1-year follow-up. This figure represents the trend of aggressive behaviour observed by MOAS subscales related to four different types of aggression.

a summary evaluation of social and personal functioning. This finding is also confirmed by a previous study conducted in RFs (Candini et al., 2015) and by a recent meta-analysis focusing on violence by acute psychiatric inpatients (Iozzino et al., 2015). It may be that in samples of patients living in a supportive environment, where treatment is granted, it is difficult to identify variables that predict which patients will behave more aggressively over time. On the other hand, patients with a history of violence were also less withdrawn, as shown by their lower scores on the BPRS withdrawal item. This may suggest that these patients may be more liable to react aggressively to environmental cues which they perceive as unpleasant or threatening. Therefore, they should be actively treated to reduce this risk and strengthen cooperative behaviour.

Finally, patients who showed higher levels of verbal aggression were more likely to commit physical aggression against objects or against other people. Since verbal aggression was the most common aggressive behaviour in our sample, it is important to monitor and manage this behaviour in order to prevent possible escalation.

4.5. Planning new services for violent patients

This study provides useful indications for planners and clinicians who have the relevant task of planning, developing and monitoring new facilities for mentally ill offenders in Italy. Patients with a history of interpersonal violence and living in RFs, where treatment and clinical supervision are granted, seem to show more aggression and violence, compared to patients who have never been violent, only to a limited extent. This may mean that intensive treatment is effective in preventing a reiteration of violent behaviour. However, this finding does not necessarily translate to outpatients living in the community: for these patients, compliance with treatment is not granted, the risk of alcohol and substance abuse present, and dropping out of treatment is a frequent event.

4.6. Limitations

Our patients' profiles correspond to residents with a high level of clinical and psychopathological impairment and a long history of illness. Moreover, a longer period of observation may lead to higher recidivism among patients with a history of violence and highlight risk factors which are not observable with 1-year follow-up. Finally, we did not directly monitor the use of alcohol and substance abuse during the follow-up period. However, in 24-h staffed RFs, the regular or frequent use of alcohol and substances was very unlikely, if not impossible.

5. Conclusion

Our data show that patients with a history of violence living in RFs do not seem to be any more aggressive than patients with no lifetime violent behaviour. The management of mentally ill offenders in the community is one of the great challenges imposed on community psychiatry. Violence by the mentally ill has a profound detrimental effect on public opinion, is associated with stigma and discrimination and poses a great burden on family members, who are often victims of such violence. If community psychiatry is able to prevent violence associated with mental disorders, the full integration of patients and their families would be much easier.

Roles of contributors

Giovanni de Girolamo and Valentina Candini designed the study, wrote the study protocol and the manuscript, and coordinated the study in all phases.

Chiara Buizza collaborated in data analysis and in writing of the

manuscript.

Davide Sisti and Clarissa Ferrari performed statistical analyses.

Viola Bulgari, Maria Elena Boero, Alessandra De Francesco, Gian Marco Giobbio, Laura Iozzino, Paolo Maggi, Giuseppe Rossi, and Beatrice Segalini were involved in study coordination, in the selection and assessment of patients and in data analysis.

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Conflicts of interest

None.

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Appendix A. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.jpsychires.2016.05.010>.

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