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Quantifying the burden of dual diagnosis

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Summary

Patients affected by dual diagnosis have more social and clinical issues than patients with either psychiatric or addictive problems. A precise quantification of this burden on the Mental Health System has not been performed yet. Accordingly, during 2015, we consecutively recruited 4387 patients admitted to Psychiatric Services, 1420 patients under treatment of the Addiction Department and 178 patients treated by both the services. Social, demographic and clinical data were compared, with a special attention to resources utilization. We demonstrated that "dual diagnosis" patients are admitted to psychiatric services earlier than "only psychiatric" patients (36.36 ± 10.90 *vs* 39.66 ± 14.45 years) but their first contact with the Mental Health System is through the Addiction Service. Globally, psychiatric treatment of "dual diagnosis" patients requires a significant higher number of different professionals/year (2.39 ± 1.58 *vs* 2.02 ± 1.35) and more different types of intervention (2.53 ± 1.90 *vs* 2.18 ± 1.63). Moreover, their admissions, both voluntary and under section, last longer. In conclusion, "dual diagnosis" patients clearly show a greater burden on the Mental Health System, needing more interventions and involving more professionals in their treatment if compared to patients with psychiatric disorder or addiction only.

Key words: dual diagnosis, Mental Health burden, substance abuse, psychiatric disorder

Introduction

The World Health Organization [1] has defined "Dual Diagnosis" (DD) as the coexistence, in the same individual, of substance abuse/dependence (SUD) and psychiatric disorders. Three USA researches - The Epidemiological Catchment Area Survey [2], the National Comorbidity Survey [3] and the National Longitudinal Alcohol Epidemiologic Survey [4], based on the general population and using standardized diagnostic systems- provided information on international epidemiology of "DD or complex" and highlighted a strong association between SUD and psychiatric disorders. A lifetime prevalence of 29% of SUD or alcohol abuse (OR = 2.7) has been attested in patients affected by mental illness. Furthermore, 45% of SUD or alcohol abusers develops a mental disorder (OR = 2.9). The highest rate is among drug users, who have a comorbid mental disorder in the 53% of subjects (OR = 4.5) *vs* 37% in alcohol abusers (OR = 2.3).

The Italian situation has been examined in multicenter researches [5-7] in the Addiction Services of Milan, Rome and Cagliari. Results showed that 35% of SUD patients have a lifetime diagnosis of mood disorder while 32% of patients affected by affective disorders and 47% of those affected by schizophrenic dis-

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orders have a comorbid SUD. The most frequent comorbidity is between psychiatric illness and alcohol, followed by cannabis and cocaine abuse. A recent review [8] states that the most common diagnosis in "DD" patients are psychosis (in men) and mood disorders (in women), without neglecting the role of personality disorders, particularly antisocial [9-11], and anxiety disorders [12-15].
Many papers agree in defining the "typical" complex patient as male, young, unemployed and with low cultural level [16,17]. "DD or complex" patients have more inadequate social status [18], worse interpersonal and family relationships [19-21], employment difficulties [22,23], achieve poorer academic results [24-26] and have more legal issues [27,28]. The most relevant risk factors are social status background, family history of SUD and criminality [8].
Several studies show the negative effects of drug intake on mental illness [29]. "DD or complex" patients have worse prognosis, more complications and repeated admission [30-32], less compliance to treatment [33,34], the worst response to antipsychotics [35,36], greater cognitive impairment, increased prevalence of positive symptoms [37-39], mood disorders, violent behavior [40-44], abnormal behavior [33], suicide and severity of depressive symptoms [45,46]. Moreover, "DD or complex" patients seem to be a younger population, with earlier onset [23,47] and more important psychosocial problems [31,48-52], thus linking the "DD" patients to "complex or multi-problematic" label [53,54].
It is essential to highlight a bias in the comparison of different researches. The Mental Health System organization and Addiction Departments administration vary deeply worldwide [5,55,56]. In Italy, these agencies are even now distinct both administratively and clinically in different Regions. Therefore, it might be possible to detect some difficulties in the diagnostic process. Many professionals have low experience in the addiction field, while intoxication and withdrawal may present with psychiatric symptoms (apathy, dysphoria, fatigue, sleep disorders, acute anxiety). Moreover, if the Services belong to different organizations, it might be a lack of collaboration and the tendency to evaluate a subject as completely needy of one service only [57,58].

Materials and methods

The aim of the present study is to identify and detail the burden of dual diagnosis on the Mental Health System. In order to quantify the extent of burden due to "DD or complex" patients, we recruited consecutive subjects who had access to the Services below during a one-year period (2010):

- Psychiatric Department - ASST Monza (Italy) 4387 patients;
- SerD (Addiction Department) - ASST Monza (Italy) 1420 patients.

Both the services record patients' data on intranet systems. "Psyche" belongs to the Regional Psychiatric System, while "Sesit" belongs to the Addiction Services. We matched these two systems to identify which patients were treated by both the Departments, thus classifying them as affected by DD or "DD or complex". Intranet Systems provide patients' diagnosis and demographic data, as well as clinical history (the number of admissions to Inpatients and Outpatients Departments, the length of stay and the typology of professionals involved in their care).
Psychiatric diagnoses were grouped into 6 categories, according to the DSM-IV-TR: substance-related disorders (F.10-F.19), schizophrenia and other psychotic disorders (F29-F.20), mood disorders (F.30-F.39) anxiety disorders (F.40-F.49), personality disorders (F.60.0-F.60.9), and other category.
The substances were classified in: alcohol, cannabis, cocaine, opiates, other (hallucinogenic drugs and other drugs not listed as NPS).
Secondly, to attest resource exploitation, we merged patients' data with data from Prison Addiction Service allocated to SerD and Prison Psychiatric Service allocated to Psychiatric Department (both groups incarcerated in the State Prison of Monza, Italy), in order to detect which of them had access to these services.
Statistical analysis were performed using the program SPSS v18 (chi-square for the comparison of nominal and ordinal variables and Student's t for independent samples and analysis of one-way and two-way variance of continuous variables).

Results

The district of Monza had, in 2015, a population of 315.818 inhabitants. In the selected period of time, we identified 4387 patients who had access to Psychiatric Services (both Inpatients and Outpatients) labeled "only psychiatric" (836 of them had access to Prison Psychiatric Service), 1420 patients under treatment at SerD, labeled "only addicted" (102 of them had access to Prison Addiction Service) and 178 patients who received treatment from both the services, thus fulfilling the definition of "DD or complex" patients (46 of them convicted and in prison).
To strengthen the aim of the paper, in the present section we report and compare results of all the groups in the community and "DD or complex" patients in prison.

Characteristics of the sample (Tables I-IV)

Male subjects are 43.8% among "only psychiatric" patients, 90.7% among "only addicted" and 77.3% among "DD or complex" patients. In each group, the ratio between males and females increases in prison. The hugest difference is detectable among "DD or complex" patients in prison, with a M:F ratio of 14:1.
Differences are statistically significant (Pearson Chi-square = 1234,026; df = 4; $p < 0,001$).
The mean age of the whole sample is 43.71 ± 14.2 years. The oldest population is "only psychiatric" one, with a mean age around 48 years (47.85 ± 14.9). "Only ad-

Table I. Sex and Sex ratio in the samples.

	M	Ratio M:F
"Only psychiatric"	48.8%	1.28:1
"Only addicted"	90.7%	9.8:1
"DD or complex" "DD or complex"in prison	77.3% 93.5%	3.4:1 14:1

Table II. Marital Status

	"Only psychiatric"	"DD or complex"	"Only addicted"	"DD or complex" in prison
Unmarried	45,40%	52,10%	56,40%	60,70%
Married	40,50%	32,20%	28,40%	25,00%
Separated	5,90%	9,90%	9,90%	7,10%
Divorced	4,00%	4,10%	3,70%	3,60%
Widow	4,20%	1,70%	1,60%	3,60%

dicted" patients are halfway, with a mean age around 43 years (42.87 ± 9.66), while "DD or complex" represents the youngest part in the community, having a mean age around 38 years (38.08 ± 9.88). "DD or complex" patients in prison are younger than those in the community, with a mean age around 35 years (35.61 ± 8.36).
The differences are statistically significant (Anova F = 225.395; df = 4/5931; p < 0.001).
"Only psychiatric" patients show the highest rate of married subjects (40,5%) *vs* 32,2% in "DD or complex" patients and 28,4% in "only addicted". The rate decrease to 25% in "DD or complex" patients in prison. In our sample, the ratio Married/unmarried is 1.12 for "Only psychiatric" patients, 1.61 for "DD or complex" patients, 1.98 for "only addicted" (Pearson Chi-square = 92,237; df = 16; p < 0,001).

Table III. Education.

Education	"Only psychiatric"	"DD or complex"	"Only addicted"	"DD or complex" in prison
None	2,20%	0,80%	0,40%	0,00%
Elementary	15,70%	11,90%	8,60%	18,50%
Junior High School	42,70%	58,50%	64,10%	77,80%
Subtotal	60,60%	71,20%	73,10%	96,30%
High School	31,40%	22,00%	24,50%	3,70%
University degree	7,90%	6,80%	2,20%	0,00%
Subtotal	39,30%	28,80%	26,70%	3,70%
Total	100,00%	100,00%	100,00%	100,00%

From an educational point of view, it is possible to highlight the consequences of drug intake on the level of education achieved. "Only psychiatric" patients have the highest rate of high school degree both in the community (31,4%) and in prison (30,8%), and globally achieve high educational levels more than the other groups (p < 0.001).
Drug addiction seems to be detrimental on educational level, but, as documented below, its onset occurs earlier than psychiatric illness', thus influencing the educational goal a subject may achieve.
The rate of employed subjects is 40,4% among "only psychiatric" patients, 43,1% among "DD or complex" and 61% among "only addicted" patients.
The former have the highest rate on non-productive subjects, even if real unemployed sample is the lowest (20,4%) due to higher rates of housewives, students, retired and disability pensioned. Most of the "DD or complex" population in prison were unemployed before conviction (75%). All the differences are statistically significant (Chi-square = 925.374; df = 28; p < 0.001).

Psychiatric History and psychiatric diagnosis

"DD or complex" patients have an earlier access to psychiatric treatment compared to "only psychiatric" patients (36.36 years, ±10.90, *vs* 39.66 years, ±14.45; p = 0.008).
"DD or complex" patients have access to SerD earlier than to psychiatric service (32.84 years *vs* 36.36 years), even if no differences in age at first access to SerD have been detected if compared with "only addicted" patients -32.84 ± 9.48 years and 32.91 ± 8.51 years , p > 0.05.
Therefore, "DD or complex" cases come to clinical attention first due to drug linked disorders and then to clinical psychiatric problems.
"Only psychiatric" patients are affected by:
schizophrenia and other psychotic disorders (22.4%);
- anxiety disorders (29.6%);
- mood disorders (21.4%);
- personality disorder (11, 4%);
- and other diagnoses (oligophrenia, ecc.) (13%);

while "DD or complex" patients suffer from:
- personality disorders (29.0%);
- anxiety disorders (21.9%);
- affective disorders (16.1%);
- schizophrenia and other psychotic disorders (7.7%).

The differences are statistically significant (Pearson Chi square = 175.590, df = 5, p < 0.001).
A comparison between different diagnosis, may highlight that the earliest onset among "only psychiatric" patients is due to personality disorders (33.98 ± 10.95 years), while among "DD or complex" patients the youngest at onset are schizophrenics (30.92 ± 9.47 years). In both groups, mood disorders have the latest onset (46.63 ± 14.05 years and 43.85± 9.79 years, respectively), followed by anxiety disorders (with onset at 41.66, 13.32 and 40.93 years ds, ds 9.31).
All the psychiatric disorders seem to start 1 to 5 years

Table IV. Occupation.

		"Only psychiatric"	"DD or complex"	"Only addicted"	"DD or complex" in prison
Productive	Unemployed	20,40% 9,60% 4,30% 13,10% 12,30% 59,70%	48,60% 2,80% 0,00% 1,80% 3,70% 56,90%	33,40% 0,50% 1,30% 2,00% 1,80% 39,00%	75,00% 0,00% 0,00% 0,00% 3,60% 78,60%
	Housewife				
	Student				
	Retired				
	Disability Pensioned				
	Subtotal				
Non-productive	White Collar	16,70% 20,30% 3,40% 40,40%	10,10% 26,60% 6,40% 43,10%	0,00% 53,40% 7,60% 61,00%	0,00% 17,90% 3,60% 21,50%
	Blue Collar				
	Self Employed				
	Subtotal				
	total	100,00%	100,00%	100,00%	100,00%

earlier in "DD or complex" patients compared to "only psychiatric" patients.
The most relevant gap is in psychotic onset, since it debuts 5 years in advance in "DD or complex" patients.
These differences are statistically significant at two-way analysis of variance for group F = 6.958, df = 1/9, 386, p = 0.026; for psychiatric diagnosis F = 30.279, df = 5/5, p = 0.001.

Psychiatric follow-up

It is noticeable that "DD or complex" patients are in charge to psychiatric service for a shorter period (18 months less) if compared to "only psychiatric" patients (6.60 years ± 7.47, compared to 7.96 ± 9.03 years). This difference does not result statistically significant.
Neurotic patients are in charge for the shortest period in both the groups (3.74, ±5.93 vs 4.81 years, ±7.30), while the most long-lasting period is due to psychotic disease, with a burden on Mental Health Service of 13.64 years (±10.34) for "only psychiatric" patients, and 9.25 years (±7.16) for "DD or complex" patients. The burden on psychiatric service given by personality disorders is longer for "DD or complex" patients than for "only psychiatric" (8.58 years, ±8.42, vs 7.48 years, ±7.41).
On the contrary, remaining psychiatric disorders are in charge to psychiatric services for longer in "only psychiatric" patients.

Voluntary and under section admission (Table V)

The number of admissions per year is very similar in both the groups: 1.57 ± 1.12 admission/year for "DD or complex" patients *vs* 1.46 ± 1.18 admission/year for "only psychiatric"; 1.69 ± 1.01 *vs* 1.46 ± 1.23 in voluntary admission and 1.13 ± 0.35 *vs* 1.10 ± 0.31 for admission under section.
It seems worthy to stress the difference in the length of stay under section which is of 37.50 days (± 61.54) for "DD or complex" patients, *vs* 17.68 days (±14, 47) for "only psychiatric" patients.
Although a lack of statistically significance, data suggest that, even with similar number of admission/year, "DD or complex" patients remain in the ward longer, particularly under section, compared to "only psychiatric" patients.
The same trend is confirmed if considered the "Global length of admission" (31.74 ± 42.42 *vs* 22.53, ± 32.47) and "Voluntary length of admission"(26.88, ± 28.62, *vs* 22.41, ± 34.49).

Addiction

"Only addicted" patients abuse mainly of opioids (39.8%), then cocaine (27.3%) and alcohol (22.1%).
"DD or complex" patients prefer alcohol (43.1%), then opioids (29.9%) and cocaine (21.6%)-thus confirming Literature. The differences are statistically significant (Pearson Chi-square = 44.297, df = 4, p < 0.001), indicating a possible role of psychiatric illness in influencing the choices of certain drug (Table VI).
"DD or complex" patients with opioid abuse start to use it one year and a half before "only addicted" to opioid patients (32.09, ±8.99 vs 33.72 years, ±8.44). An opposite picture is detectable for "DD or complex" patients addicted to cocaine or cannabis, which abuse starts about

Table V. Admissions to Inpatient Psychiatric Unit.

	Per year	"Only psychiatric"	"DD or complex"	T	p
Number of admission	Total	1,46 ± 1,18	1,57 ± 1,21	-0,41	0.68
	Voluntary	1,46 ± 1,22	1,69 ± 1,01	-0,71	0.48
	Under Section	1,105 ± 0,30	1,13 ± 0,35	-0,19	0,85
Length of stay	Total	22,53 ± 32,46	31,74 ± 42,42	-1,28	0,20
	Voluntary	22,41 ± 34,49	26,88 ± 28,62	-0,51	0,61
	Under Section	17,68 ± 14,47	37,50 ± 61,54	-0,91	0,39

Table VI. Substance and Illicit Drugs.

	"DD or Complex"	"Only Addicted"
Alcohol	43,10%	22,10%
Cannabis	3,60%	10,30%
Opioids	29,90%	39,80%
Cocaine	21,60%	27,30%
Other	1,80%	0,40%

two years later than "only addicted" to these drugs (33.64 years, ±10.52, vs 31,6 years, ±8.03 and 34.67 years, ±4.51, vs 32.41, ±8.11). These differences, however, are not statistically significant.

"DD or complex" patients are in charge to SerD one year longer than "only addicted" patients (5.54 years, ±5.34 vs 4.29 years, ±4.33).

The hugest difference is detectable for opioid abusers, who are in charge to SerD for an average of 6.97 years (±6.23) if "DD or complex", and 5.35 years (±4.82) if "only addicted".

Those receiving treatment for cocaine (4.04, ±3.59, vs 3.23 years, ±3.40) and cannabinoids (2.75 ± 2.87 years vs 1.81 ± 1.13 years) remain in charge longer when receiving treatment from both the SerD and Psychiatric Services.

Statistically, "DD or complex" and "only addicted" patients have the same burden on SerD, but the former have also access to psychiatric service resources (analysis of two-way variance: for group $F = 3.078$, $df = 1/35, 316$, $p = 0.088$; for substance abuse $F = 12.229$, $df = 4/23, 231$, $p < 0.001$).

Treatments

The average number of treatment per person given by psychiatric services is the same for both "DD or complex" and "only psychiatric" patients. But the difference roots in the typology of professional involved in the treatment.

"Only psychiatric" patients require significantly more psychological sessions (4.87, ±6.65, vs 3.20, ±5.52) and nursing interventions (13,77, 32,05 ds , vs 9.23, ±13.86) while "DD or complex" patients demand a significantly higher number of medical (6.42, ±7.12, compared with 4.95, 4.88 ds -) and social worker interventions (9.40, ds 13, 03, vs 5.85, ±7.71). No differences are detectable in the number of interventions by other professionals.

The number of different professional typology (ToP) involved in the treatment, might emphasize the complexity of "DD or complex" clients, which require 2.39 (±1.58) ToP vs 2.02 (±1.34) ToP needed by "only psychiatric" patients (Table VII).

Accordingly to ToP, "DD or complex" patients need a greater variety in the number of intervention, 11,34 (±16,99) for "DD or complex" vs 11,21 (±22,65) for "only psychiatric" patients.

"Only psychiatric" patients require a greater number of visits pro capite/ year 8.78 (±19.25) vs 6.78 (9.77) in "DD or complex" patients, which, instead, obtain a greater number of supervisions or team meetings: 6.13 (±8.23) patient/year vs 3.43 (±4.51) patient/year for "only psychiatric" patients. The comparisons are statistically significant (see Table VIII).

These results clearly show that "DD or complex" patients need both access to more services and a greater variety

Table VII. Professionals and Treatment

Per year	"Only psychiatric"	"DD or complex"	T	p
Number of intervention	11,21±22,65	11,34±16,99	-0,08	0.94
ToP	2,02±1,34	2,39±1,58	-3,07	<0,01
Social worker	8,85±7,70	9,40±13,03	-1.96	0,06
Educator	5,79±7,33	6,59±8,43	-0,65	0,52
Nurse	13,77±32,04	9,23±13,86	2,59	0,01
Psychiatrist	4,95±4,88	6,42±7,11	-2,54	0,02
Psychologist	4,87±6,64	3,20±5,52	2,39	0,02

Table VIII. Type of interventions.

Per year	"Only psychiatric"	"DD or complex"	T	p
Professional appointment	8,78±19,24	6,78±9,76	2,42	0,02
Support activity	6,15±9,87	5,78±6,02	0,29	0,77
Team meeting	3,43±4,50	6,13±8,22	-2,86	0,01

of treatment than those necessary to "only psychiatric" patients. Thus, the increased burden given by "DD or complex" patients' treatment, implies the integration between the professionals involved in addition to individual performance.

Discussion

"DD or complex" patients may be defined as a particular population of clients with specific characteristics, unique clinical implications and with a high burden on the Health System and society. Compared to "only psychiatric" and "only addicted" patients, they seems to be halfway in social and demographic features. Their male/female ratio increases dramatically if in prison, as well as their age decreases in the same conditions. Substance abuse appears to be detrimental on educational goals achieved, thus reducing the possibility of a full personal development. All these results are compatible with Literature evidences describing a typical "complex" patient.

"DD or complex" patients have an earlier access to SerD than to Psychiatric Service, underling the possible influence of addiction on mental illness onset, particularly if it is taken into consideration that their psychiatric illnesses have an earlier onset than those of psychiatric patients.

The main detected diagnosis is "personality disorders", and this subpopulation is also the one with the longest period under care of Psychiatric Service (more than personality disorders diagnosed in psychiatric patients).

The burden on the Mental Health System is also underlined by a longest period under the care of the Addiction Service.

It is also due to a longer length of admission (both voluntary and under section), and by the number of professionals involved. Furthermore, it is also necessary a greater integration between different services and, intra-service, between different professionals.

Conclusion

"Dual diagnosis or complex" patients clearly appear to be a population marked by higher and various needs[59, 60]. The complexity of their situation is mirrored in the greater burden they have on Mental Health Services and in their need of social support. The evidence of our results implies duty considerations [61,62]. The possibility to integrate Psychiatric and Addiction services, as well as a wider training of professionals, may reduce possible waste of time and resources [63,64]. Finally, it is necessary to stress the role of drug abuse as a risk factor for mental illness onset, and to wish for wider and organized prevention programs [65,70].

Reference

1 Babor T, Room R. Lexicon of alcohol and drug terms. Geneva: World Health Organization 1994.

2 Regier DA, Farmer ME, Rae DS, et al. Comorbidity of mental disorders with alcohol and other drug abuse. Results from the Epidemiologic Catchment Area (ECA) Study. JAMA 1990;264:2511-8.

3 Kessler RC, McGonagle KA, Zhao S, et al. Lifetime and 12-month prevalence of DSM-III-R psychiatric disorders in the United States. Results from the National Comorbidity Survey. Arch Gen Psychiatry 1994;51:8-19.

4 Grant BF. Prevalence and correlates of drug use and DSM-IV drug dependence in the United States: results of the National Longitudinal Alcohol Epidemiologic Survey. J Subst Abuse 1996;8:195-210.

5 Clerici M. Substance abuse and psychopathology. A diagnostic screening of Italian narcotic addicts. Soc Psychiatry Psychiatr Epidemiol 1989;24:219-26.

6 Pani PP. Psychopathological heterogeneity in opium drug addicts. Minerva Psichiatr 1991;32:145-50.

7 Pozzi G, Tacchini G, Di Giannantonio M, et al. Mental disorders of drug addicts in treatment: a study of prevalence with retrospective evaluation by means of structured diagnostic interviews. Minerva Psichiatr 1995;36:139-54.

8 Miquel L, Roncero C, Lopez-Ortiz C, et al. Epidemiological and diagnostic axis I gender differences in dual diagnosis patients. Adicciones 2011;23:165-172.

9 Helzer JE, Pryzbeck TR. The co-occurrence of alcoholism with other psychiatric disorders in the general population and its impact on treatment. J Stud Alcohol 1998;49:219-24.

10 Zilberman ML, Tavares H, el-Guebaly N. Relationship between craving and personality in treatment-seeking women with substance-related disorders. BMC Psychiatry 2003;3:1-6.

11 Fenton MC, Keyes K, Geier T, et al. Psychiatric comorbidity and the persistence of drug use disorders in the United States. Addiction 2012;107:599-609.

12 Tomasson K, Vaglum P. A nationwide representative sample of treatment-seeking alcoholics: a study of psychiatric comorbidity. Acta Psychiatr Scand 1995;92:378-85.

13 Merikangas KR, Mehta RL, Molnar BE. Comorbidity of substance use disorders with mood and anxiety disorders: results of the International Consortium in Psychiatric Epidemiology. Addict Behav 1998;23:893-907.

14 Schneier FR, Foose TE, Hasin DS, et al. Social anxiety disorder and alcohol use disorder comorbidity in the National Epidemiologic Survey on Alcohol and Related Conditions. Psychol Med 2010;40:977-88.

15 Wu P, Goodwin R D, Fuller C, et al. The relationship between anxiety disorders and substance use among adolescents in the community: specificity and gender differences. J Youth Adolesc 2010;39:177-88.

16 Helasoja V, Lahelma E, Prattala R. The sociodemographic patterning of drinking and binge drinking in Estonia, Latvia, Lithuania and Finland, 1994-2002. BMC Public Health 2007;7:241-3.

17 Vasquez EP, Gonzalez-Guarda RM, De Santis JP. Acculturation, depression, self-esteem, and substance abuse among Hispanic men. Issues Ment Health Nurs 2011;32:90-7.

18 Reif S, Cheng DM, Allensworth-Davies D, et al. Chronic disease and recent addiction treatment utilization among alcohol and drug dependent adults. Subst Abuse Treat Prev Policy 2011;18:6-28.

19 Hasin DS, Stinson FS, Ogburn E, et al. Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Arch Gen Psychiatry 2007;64:830-42.

20 Fowler IL, Carr VJ, Carter NT, et al. Patterns of current and lifetime substance use in schizophrenia. Schizophr Bull 1998;24:443-55.

21 Addington J, Duchak V. Reasons for substance use in schizophrenia. Acta Psychiatr Scand 1997 96:329-33.

22 Mowbray CT, Ribisl K, Solomon M et al. Characteristics of dual diagnosis patients admitted to an urban, public psychiatric hospital: an examination of individual, social, and community domains. Am J Drug Alcohol Abuse 1997;23:309-26.

23 Jimenez-Castro L, Raventos-Vorst H, Escamilla M. Substance use disorder and schizophrenia: prevalence and sociodemographic characteristics in the Latin American population. Actas Esp Psiquiatr 2011;39:123-30.

24 Lagerberg TV, Andreassen OA, Ringen PA, et al. Excessive substance use in bipolar disorder is associated with impaired functioning rather than clinical characteristics, a descriptive study. BMC Psychiatry 2010;10:9-15.

25 Kavanagh DJ, Waghorn G, Jenner L, et al. Demographic and clinical correlates of comorbid substance use disorders in psychosis: multivariate analyses from an epidemiological sample. Schizophr Res 2004;66:115-24.

26 Mueser KT, Yarnold PR, Rosenberg SD, et al. Substance use disorder in hospitalized severely mentally ill psychiatric patients: prevalence, correlates, and subgroups. Schizophr Bull 2000;26:179-92.

27 Ruiz P, Primm A, eds. Disparities in psychiatric care. Baltimore/Philadelphia: Wolters Kluwer/Lippincott Williams & Wilkins 2010.

28 Fazel S, Gulati G, Linsell L, et al. Schizophrenia and violence: systematic review and meta-analysis. PLoS Med 2009;6-13.

29 Benaiges I, Prat G, Adan A. Neuropsychological aspects of dual diagnosis. Curr Drug Abuse Rev 2010;3:175-88.

30 Haywood TW, Kravitz HM, Grossman LS, et al. Predicting the revolving door phenomenon among patients with schizophrenic, schizoaffective, and affective disorders. Am J Psychiatry 1995;152:856-61.

31 Adams MW. Comorbidity of mental health and substance misuse problems: a review of workers' reported attitudes and perceptions. J Psychiatr Ment Health Nurs 2008;15:101-8.

32 Mental Health Policy Implementation Guide: Dual Diagnosis Good Practice Guide. London: Department of Health 2002.

33 Baker KD, Lubman DI, Cosgrave EM, et al. Impact of cooccurring substance use on 6 month outcomes for young people seeking mental health treatment. Aust NZ J Psychiatry 2007;41,896-902.

34 Lang K, Meyers J, Korn JR. Medication adherence and hospitalization among patients with schizophrenia treated with antipsychotics. Psychiatr Serv 2010;1239-47.

35 Kelly TM, Daley D, Douaihy AB. Treatment of substance abusing patients with comorbid psychiatric disorders. Addict Behav 2012;37:11-24.

36 Manning V, Betteridge S, Wanigaratne S, et al. Cognitive impairment in dual diagnosis inpatients with schizophrenia and alcohol use disorder. Schizophr Res 2009;114:98-104

37 Lysaker P, Bell M, Beam-Goulet J, et al. Relationship of positive and negative symptoms to cocaine abuse in schizophrenia. J Nerv Ment Dis 1994;182:109-12.

38 Kerfoot KE, Rosenheck RA, Petrakis IL, et al. Substance use and schizophrenia: adverse correlates in the CATIE study sample. Schizophr Res 2011; 32:177-82.

39 Landheim AS, Bakken K, Vaglum P. Impact of comorbid psychiatric disorders on the outcome of substance abusers: a six year prospective follow-up in two Norwegian counties. BMC Psychiatry 2006;6:44-9.

40 Cuffel BJ, Shumway M, Chouljian TL, et al. A longitudinal study of substance use and community violence in schizophrenia. J Nerv Ment Dis 1994;182:704-8.

41 Soyka M. Substance misuse, psychiatric disorder and violent and disturbed behaviour. Br J Psychiatry 2000;176:345-50.

42 McNiel DE, Binder RL. Effectiveness of a mental health court in reducing criminal recidivism and violence. Am J Psychiatry 2007;164:1395-403.

43 Latt N, Jurd S, Tennant C, et al. Alcohol and substance use by patients with psychosis presenting to an emergency department: changing patterns. Australas Psychiatry 2011;19:354-9.

44 Ogloff JR, Lemphers A, Dwyer C. Dual diagnosis in an Australian forensic psychiatric hospital: prevalence and implications for services. Behav Sci Law 2004;22:543-62.

45 Mosti A, Clerici M, eds. Lungo il confine. Tossicodipendenze e comorbilità. Milano: Franco Angeli 2003.

46 Schmidt LM, Hesse M, Lykke J. The impact of substance use disorders on the course of schizophrenia--a 15-year follow-up study: dual diagnosis over 15 years. Schizophr Res 2011;130:228-33.

47 Ringen PA, Melle I, Birkenaes AB. Illicit drug use in patients with psychotic disorders compared with that in the general population: a cross-sectional study. Acta Psychiatr Scand 2008;117:133-8.

48 Drake RE, Osher FC, Wallach MA. Homelessness and dual diagnosis. Am Psychol 1991;46:1149-58.

49 Latt N, Conigrave K, Saunders JB, eds. Addiction Medicine. Oxford: Oxford University Press 2009.

50 Compton MT, Weiss PS, West JC, et al. The associations between substance use disorders, schizophrenia-spectrum disorders, and Axis IV psychosocial problems. Soc Psychiatry Psychiatr Epidemiol 2005;40:939-46.

51 McCrone P, Menezes PR, Johnson S, et al. Service use and costs of people with dual diagnosis in South London. Acta Psychiatr Scand 2000;101:464-72.

52 Andrade LH, Viana MC, Tofol LF, et al. Influence of psychiatric morbidity and sociodemographic determinants on use of service in a catchment area in the city of Sao Paulo, Brazil. Soc Psychiatry Psychiatr Epidemiol 2008;43:45-53.

53 Capuzzi E, Pini E, Malerba MR, et al. Factors associated with

referrals to high security forensic services among people with severe mental illness and receiving inpatient care in prison. Int J Law Psych 2019;62:90-4.
54 Kranzler HR. Manual of Addiction Psychopharmacology. Arlington: American Psychiatric Publishing 2014.
55 Drake RE, Mueser KT, Brunette MF, et al. A review of treatments for people with severe mental illnesses and co-occurring substance use disorders. Psychiatr Rehabil J 2004;27:360-74.
56 Mueser KT, Drake RE, Wallach MA. Dual diagnosis: a review of etiological theories. Addict Behav 1998;23:717-34.
57 Barlati S, Stefana A, Bianconi G, et al. DViolence risk and mental disorders (VIORMED-2): a prospective multicenter study in Italy. PLOS ONE 2019;14 e0214924.
58 Morojele NK, Saban A, Seedat S. Clinical presentations and diagnostic issues in dual diagnosis disorders. Curr Opin Psychiatry 2012;25:181-6.
59 di Giacomo E, Clerici M. Psychiatric illness in incarcerated population. Rassegna Italiana di Criminologia 2018;12:225-30.
60 Carrà G, Crocamo C, Borrelli P, et al. Area-level deprivation and adverse consequences in people with substance use disorders: findings from the Psychiatric and Addictive Dual Disoerder in Italy (PADDI) Study. Subst Use Misuse 2017;52:451-8.
61 Fazel S, Hayes AJ, Bartellas K, et al. Mental health of prisoners: prevlence, adverse outcomes and interventions. Lancet Psychiatry 2016;3:871-81.
62 Carrà G, Bartoli F. Brambilla G, et al. Comorbid addiction and major mental illness in Europe: a narrative review. Subst Abuse 2015;36:75-81.
63 Carrà G, Crocamo C, Borrelli P, et al. Correlates of dependence and treatment for substance use among people with comorbid severe mental and substance use disorders: findings from the Psychiatric and Addictive Dual Disorder in Italy (PADDI) Study. Compr Psychiatry 2015;58:152-9.
64 Carrà G, Bartoli F, Clerici M, elGuebaly N. Psychopathology of dual diagnosis: new trumpets and old uncertainties. J Psychopathology 2015;21:390-9.
65 Giampieri E, Alamia A, Galimberti GL, et al. “Dual diagnosis” and use of healthcare resources in psychiatric care services. The experience of Monza and Brianza. J Psychopathology 2013;19:199-207.
66 Cortini E, Clerici M, Carrà G. Esiste un approccio europeo alle comunità terapeutiche per i disturbi correlati a sostanze? Una revisione narrativa. J Psychopathology 2013;19:27-33.
67 Bartoli F, Scarone S, Clerici M. Risk of hospitalization among patients with co-occurring psychotic and substance use disorders: a 12-year follow-up. Rivista di Psichiatria 2013;48:51-9.
68 Carrà G, Clerici M. Dual Diagnosis. Policy and practice in Italy. Am J Addic 2005;15:125-30.
69 Carrà G, Clerici M. The Italian Association on Addiction Psychiatry (SIP.Dip), formerly the Italian Association on Abuse and Addictive Behaviours. Addiction 2003;98:1039-42.
70 Clerici M, de Bartolomeis A, De Filippis S, et al. Patterns of managements of patients with dual disorder (psychosis) in ITaly: a survey of psychiatrists and other phisicians focusing on clinical practice. Frontiers in Psychiatry 2018;9:575-80.