

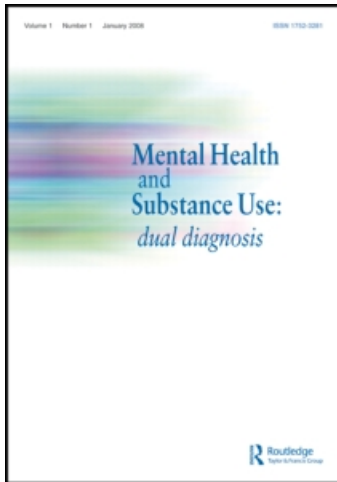
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Use of health care services by patients with co-occurring severe mental illness and substance use disorders

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Background: To better respond to the health care needs of people with co-occurring mental illness and substance use disorders, it is vital to understand their itinerary through the health care system.

Aim: To describe the characteristics of service utilization among patients with co-occurring disorders in a large urban area.

Method: We used a sample ($n = 5467$) constituted from administrative and clinical databases. Those identified as having substance use disorders and psychoses were followed over 12 months with respect to their utilization of medical services. A descriptive analysis of the data and a two-step cluster analysis were undertaken.

Results: Our analyses revealed a relatively high utilization of emergency services, outpatient clinics, private practices and hospitalization among patients with co-occurring disorders of severe mental illness and substance use. The two-step cluster analysis produced four heterogeneous groups in terms of service utilization.

Conclusions: This study demonstrates the need to develop strategies for organizing health care and services that are adapted to various sites of service utilization and to diverse profiles of patients with co-occurring mental illness and substance use disorders.

Keywords: co-morbidity; co-occurring; mental health; substance use disorders; service utilization

Introduction

We mean by 'co-occurring' or 'co-morbidity' an association of mental disorders and disorders linked to dependence or excessive utilization of a substance such as alcohol, opiates, derivatives of cannabis, cocaine, stimulants, hallucinogens and volatile solvents.

Over the past two decades, the issue of co-occurring disorders has become an important question for health care planners (Health Canada, 2001). Among psychiatric disorders, co-morbidity generates the highest costs (McCrone et al., 2000). Co-morbidity is a major challenge because of its high prevalence and because the characteristics of this clientele necessitate an integrated management approach (Nadeau, 2001). In general, psychiatric services are not well prepared to take on clientele that require integrated services in addiction and mental health. Moreover, the itinerary through the health care network for patients with co-occurring mental illness and substance use disorders is still not clear. There have been few studies in Quebec and in other provinces of Canada on the

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use of services by this clientele (Bonin, Fournier, & Blais, 2005; Urbanoski, Rush, Wild, Bassani, & Castel, 2007).

In order to contribute to the design of interventions specifically directed towards patients with co-occurring mental illness and substance use disorders, we have attempted to understand the individuals' treatment itineraries and the characteristics of service usage. The aim was to assess how homogeneous this population is, in terms of service utilization, and to determine the potential existence of multiple utilization profiles.

To this end, we asked the following questions about patients with co-occurring severe mental illness and substance use disorders:

- What services are being used, and what are the characteristics of the sites where they are being provided in urban settings?
- Are there different clinical, socio-demographic and service utilization profiles?

Context: co-occurring mental illness and substance use disorders

Generally, among individuals with substance use disorders, the rate of co-occurrence of mental illness is high. In several studies, it has been demonstrated that between 33% and 65% of substance-dependent patients admitted to rehabilitation centres presented with psychiatric disorders, were previously treated for psychiatric disorders (Guyon & Landry, 1996; Ministère de la Santé et des Services Sociaux, 2005; Ross, Glaser, & Germanson, 1988). Similarly, many patients suffering from mental illness show an association with substance use disorders (Beaumont, Charbonneau, & Delisle, 2005; Clark, Samnaliev, & McGovern, 2007; Kessler et al., 1996; Landheim, Bakken, & Vaglum, 2006; Ministère de la Santé et des Services Sociaux, 2005; Nadeau, 2001; RachBeisel, Scott, & Dixon, 1999). Between 25% and 60% of individuals with serious mental disorders also present with substance abuse or dependency on drugs and alcohol (Beaumont et al., 2005; Craig et al., 2008; Drake, Mueser, & Brunette, 2007; Ministère de la Santé et des Services Sociaux, 2005; Toner et al., 1992; Weaver et al., 2003).

Individuals with both substance use disorders and severe and persistent mental illness, generally present an increasing level of disorganization that is often recurrent (Beaumont et al., 2005). Thus, the association of both disorders has many consequences. Patients with co-morbidity conditions with severe mental illness have a high rate of traumatic brain injury (Corrigan & Deutschle, 2008). They are less likely to stay in treatment and are at higher risk of using mental health care services (Beaumont et al., 2005). There are multiple medical and social problems associated with co-morbidity: higher rates of relapse, suicidal thoughts and actions, violence, homelessness, itinerancy, poverty, and marginalisation (Craig et al., 2008; Drake et al., 2007; Kamali et al., 2000).

The most problematic patients are those with problems related to substance use and severe mental disorders, because of the complexity of their health care needs. Management of their treatment is still inadequate, in that each disorder is treated in isolation (Nadeau, 2001; RachBeisel et al., 1999). There is a high prevalence of the 'revolving door' syndrome among this population. Over the last century, the delivery of mental health services has evolved differently from the provision of addiction treatment (Comité Sénatorial Permanent des Affaires Sociales des Sciences et de la Technologie, 2004). The result has been the emergence of two distinct systems of care for mental illness and addiction; and inadequate treatment of comorbidity, with services being received here and there, with short stays and a proliferation of psychiatric hospitalizations.

The co-occurrence of mental illness and substance use disorders is also a risk factor for the utilization of health care overall, and in particular, emergency services (Arfken et al., 2004; Beaumont et al., 2005; Dickey et al., 2002; Elhai & Ford, 2007; Pasic, Russo, & Roy-Byrne, 2005; Wu, Ringwalt, & Williams, 2003). Thus, Elhai and Ford (2007) demonstrated that a higher intensity of utilization of mental health services was most significantly associated with psychiatric variables such as mental illness and substance use disorders. Moreover, the co-occurrence of mental illness and substance use disorders is associated with a continued use of mental health services.

In addition, this apparent disorganization of services occurs in a context where integrated services and treatment programs for co-occurring mental illness and substance use disorders have proven effectiveness (Grella & Stein, 2006; Harris & Edlund, 2005; RachBeisel et al., 1999; Health Canada, 2001; Timko et al., 2003; Watkins et al., 2005). Joint projects between the drug addiction and mental health sectors have produced very positive results, leading to greater effectiveness in the treatment of mental disorders (Craig et al., 2008; Drake et al., 2001; Ministère de la Santé et des Services Sociaux, 2005). However, Craig et al. (2008) showed that integrated treatment provided by non-specialist mental health staff did not produce significant improvement in substance use or quality of life.

Methodology

Data were extracted from the linked administrative databases of Med-Echo and the Régie de l'Assurance-Maladie du Québec (RAMQ) for Greater Montreal for the fiscal years 2002–2003 and 2003–2004 (1 April to 31 March). The Med-Echo database contains clinical and demographic data on patients admitted to acute-care hospitals in all of Quebec, including Montreal. The RAMQ database contains data on medical services provided, including those in private practices. However, unlike the Med-Echo database, in which several diagnoses can be coded for a single admission, the RAMQ database allows only one diagnosis per consultation.

In the databases, diagnostic data were coded using the International Classification of Diseases, Ninth Revision (ICD-9). In the ICD-9, mental disorders are subdivided into three categories:

- (1) psychoses;
- (2) neuroses, personality disorders and other non-psychotic disorders; and
- (3) mental retardation.

Based on a preliminary analysis of the prevalence of mental disorders in 2002–2003, we retained only psychoses because the prevalence of severe personality disorders was insignificant.

Thus, our sample ($n = 5467$) was made up of patients presenting with both a diagnosis of psychosis or drug addiction and a diagnosis of addiction or psychosis at a given time in their health care itinerary (see Table 1). Patients were identified in the following manner:

- (1) all subjects with a principal or secondary diagnosis, according to the ICD-9 criteria, of drug-induced psychoses;¹
- (2) all subjects with a cross-referencing of CIM9 with:
 - a primary or secondary diagnosis of psychoses:² schizophrenic psychoses, severe personality disorders, affective psychoses and manic-depressive psychoses;

Table 1. Prevalence of diagnoses.

Diagnoses	Frequency	%
Drug-induced psychosis	1804	33.0
Schizophrenic psychosis	1916	35.0
Affective psychosis and manic-depressive psychosis	1874	34.3
Alcoholic psychosis	809	14.8
Alcohol dependence syndromes	639	11.7
Drug dependence (morphine, barbiturates, amphetamines, hallucinogens)	1063	19.4
Abuse of drugs in a non-dependent person and of alcohol	1116	20.4

- a primary or secondary diagnosis of addiction (alcoholic psychoses, alcohol dependence syndrome, drug dependence, drug abuse in a non-dependent person).

The possibility that a patient may be diagnosed with two or more disorders explains the fact that percentages may amount to more than 100%.

This methodology of cross-referencing diagnoses of mental health and drug addiction, even at different dates of consultation or admission in the medical network, allowed us to locate the co-morbidity of psychosis and drug addiction that actually existed in the two databases. Once identified, the administrative and clinical data for each patient were captured during 12 months from the date of recruitment. The variables linked with service utilization were:

- the number of visits in outpatient clinics, emergency rooms and private practices for mental health and/or substance use;
- the number of days of hospitalization in acute and long-term care;
- the establishment providing the care; and
- diagnosis for each admission.

Variables related to age and gender were also targeted. It should be mentioned that the 'number of days of hospitalization' is an approximation of the actual length of stay, in that it corresponds to the number of days of hospitalization in which medical acts (i.e. diagnostic and therapy acts, paramedical technical acts – radiography, biomedical analyses) were carried out.

Following a descriptive analysis of the data to identify the dimensions of service utilization among patients, a descriptive cluster analysis³ was carried out to define relatively homogeneous groups around the parameters of sex, age, diagnoses, and service utilization. We used the iterative procedure of two-step cluster analysis, which allows for the integration of dichotomous variables in group identification.

Results

The analysis results are presented in two parts:

- (1) an overall picture of the services used by patients with a co-morbidity of severe mental illness and drug addiction;
- (2) from this, the extraction of the different utilization profiles.

Utilization rates for mental health care and services

Analysis of the subjects in the sample showed an average of 1.5 emergency room visits per person over a 12-month period. Of the 5467 patients, 49.4% (i.e. 2700 patients) have at least one emergency room visit in their record, for a total of 8208 visits, with 3.04 visits per patient among those who have been admitted at least once in an emergency room.

The average number of outpatient clinic visits was 1.87 per patient, but 65.8% of all patients had none, while 21.7% had three or more. The 1872 patients who had consulted outpatient clinics did so on 10,239 occasions, with a mean of 5.47 visits per patient using outpatient clinics.

The average number of visits in private practice (clinic) was 1.05 per patient. About 37.0% of patients (2025) consulted private practices, for a total of 5758 visits, with 2.84 visits per patient among those who had consulted at least once. It should be noted that approximately 37.7% of the 5467 patients used neither outpatient clinics nor private practices.

With regard to hospital stays in psychiatric units, the mean is 3.84 hospital days per patient. Only 25.4% of the 5467 patients were admitted to psychiatric units, for a total of 21,008 days, or a mean of 15.16 days among patients admitted to psychiatric units.

The mean for hospital stays in a long-term care unit – extended care – is 0.19 days per patient. Less than 1.4% (79) of the 5467 patients were admitted, accounting for 1053 hospital days in long-term care units. However, only 17 of those patients stayed 10 days or more, for a total of 924 long-term care days, or 54.35 days per patient.

With respect to hospitalizations in acute and specialized care, we counted 8911 days in our sample, with a mean of 1.63 days per patient. However, only 21.8% of the patients were admitted to acute-care specialized services, with a mean stay of 7.84 days.

Regarding health care sites where services are received, we note that around 50% of outpatient visits were recorded in the psychiatric hospitals in Montreal. In contrast, less than 9% of emergency room visits were in psychiatric hospitals and the vast majority of the remainder visits were in general hospitals in downtown Montreal. With respect to admissions, about one-quarter of hospital days in acute-care and specialized units were in psychiatric hospitals, while 63.34% of the 1053 long-term care days were in just one psychiatric hospital – the Douglas Hospital.

Variety of utilization profiles (cluster analysis)

Two-step cluster analysis allowed us to differentiate four different groups according to gender, age, diagnosis and psychiatric services used (Table 2).

Group 1: In the cluster analysis, this group emerged, representing about 20% of the 5467 patients and made up of patients who had been diagnosed with drug-induced psychoses, with no association with other mental disorders. This group had proportionally more women and youth (10–30-years-old) than did the others.

Group 2: had the highest prevalence of drug dependence (morphine, barbiturates, amphetamines, hallucinogens, etc.) and alcohol dependence syndrome, and a higher prevalence of drug-induced psychoses (40%), schizophrenic psychoses (29%), affective and manic-depressive psychoses (37%).

Group 3: in which women represented approximately 48% of the patients, also had the highest proportion of patients aged 50 and over. This group had a high prevalence of alcoholic, affective and manic-depressive psychoses.

Group 4: more than 90% of patients presented with a diagnosis of schizophrenic psychosis, more than 50% had affective psychoses and manic-depressive psychoses and more than 30%, alcoholic psychoses. Consequently, this group presents a large

Table 2. Profiles of the four groups according to sex, age and diagnoses.

	Group 1 N1 = 996 (18.2%)		Group 2 N2 = 1915 (35.0%)		Group 3 N3 = 2320 (42.4%)		Group 4 N4 = 236 (4.3%)		Pearson Chi-squared tests (a)	p
	Freq (n)	% n/N1	Freq n	% n/N2	Freq (n)	% n/N3	Freq (n)	% n/N4		
Sex										
F (43.00%)	472	47.39	676	35.30	1124	48.45	77	32.63	92.62	0.00
M (57.00%)	524	52.61	1239	64.70	1196	51.55	159	67.37		
Age (in years)										
10-29 (22.6%)	300	30.12	425	22.19	455	19.61	56	23.73	511.98	0.00
30-49 (46.00%)	440	44.18	1180	61.62	803	34.61	91	38.56		
50+ (31.40%)	256	25.70	310	16.19	1062	45.78	89	37.71		
Diagnoses										
Present										
Drug-induced psychoses (33.00%)	996	100.00	771	40.26	13	0.56	24	10.17	3227.79	0.00
Alcoholic psychoses (14.80%)	11	1.10	193	10.08	534	23.02	71	30.08	350.01	0.00
Schizophrenic psychoses (35.00%)	62	6.22	546	28.51	1093	47.11	215	91.10	873.50	0.00
Affective & manic-depressive psychoses (34.30%)	77	7.73	704	36.76	971	41.85	122	51.69	407.70	0.00
Drug dependence (19.40%)	0	0.00	1005	52.48	30	1.29	28	11.86	2071.40	0.00
Drug and alcohol abuse (20.40%)	0	0.00	993	51.85	91	3.92	32	13.56	1815.81	0.00
Alcohol dependence syndrome (11.70%)	4	0.40	538	28.09	51	2.20	46	19.49	838.59	0.00

(a) No cell has a theoretical population of less than 5.

co-occurrence of diverse diagnoses. However, only 10% of these patients presented with drug-induced psychoses.

As seen in Table 3, these four groups present very distinct health care service utilization profiles.

The mean of 5.52 emergency room visits among patients in Group 4 is significantly higher than the mean in Group 1 (0.48), Group 2 (2.44) and Group 3 (0.76). Group 4 (with 4.3% of the 5467 patients) also presents very high utilization of the other services, with means of 3.07 for outpatient visits, 18.72 for hospital days in acute care, and 38.7 for hospital days in a psychiatric unit. The particular feature of this group is that more than 91% of the patients have a diagnosis of schizophrenic psychosis and more than 50% have affective psychoses and manic-depressive psychoses.

In contrast to Group 4, Group 1 includes patients who have been diagnosed exclusively with drug-induced psychoses, where there is a very low rate of service utilization: less than one visit per patient to emergency rooms, outpatient clinics and private practice, and less than one day for the various hospitalizations.

Group 3 is characterized by a low emergency room utilization (0.76 visits), but also by a higher rate of visits to outpatient clinics than Groups 1 and 2. Group 2 (35% of patients) has a high rate of emergency room utilization (2.44 visits on average) and the highest utilization of private practices, with 2.19 visits per patient, as compared with one visit or less among other groups. In addition, it was observed that most of the patients attending private practices are in this group. Nevertheless, a comparative analysis of the different groups of users of private practices shows no significant association between frequency of utilization of emergency rooms and private practice visits.

To conclude, it should be noted that this data does not describe the whole range of utilization of first-line services (rehabilitation centres, private offices) among patients with co-occurring disorders, because the databases we used only provide information on services provided in private practices.

Hospital days in psychiatric units, long-term care, and acute and specialized care are under-represented, because the administrative database of the RAMQ only provides information on days when medical acts were carried out. Therefore, hospital days registered in the RAMQ database do not cover the total duration of hospital stays.

Discussion

The picture drawn of service utilization shows relatively high utilization of overall mental health care, especially in emergency rooms, among patients presenting with substance use

Table 3. Service utilization profile for the four groups.

Group	Emergency room visits		Outpatient visits		Private practice visits		Hospital days, acute-care and specialized unit		Hospital days, long-term care unit		Hospital days, psychiatric unit	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	0.48	0.78	.30	1.13	0.73	0.98	0.16	1.02	0.01	0.32	0.33	2.02
2	2.44	3.50	1.36	3.03	2.19	4.55	0.90	2.74	0.00	0.08	1.29	4.30
3	0.76	1.42	2.85	5.84	0.33	1.02	1.12	3.19	0.04	0.33	3.91	8.89
4	5.52	9.65	3.07	4.10	0.32	1.04	18.72	25.16	3.97	16.64	38.70	44.40

disorders and severe mental illness. This high utilization level was also observed in the studies of Clark et al. (2007), Elhai and Ford (2007), Harris and Edlund (2005), Kessler et al. (1999), and Marshall et al. (2001).

The higher utilization of emergency rooms confirms that patients with comorbidity are not adequately followed and do not receive appropriate treatments for both disorders (Harris & Edlund, 2005; Kessler et al., 1999; Mojtabai, 2004; Nadeau, 2001; Pasic et al., 2005; Rosenheck, Resnick, & Morrissey, 2003; Watkins et al., 2001). As stressed in the introduction, this inadequate treatment management (approach based on sequential treatment) would partly explain the high level of service utilization, particularly for emergency rooms.

The low rate of utilization of psychiatric hospital emergency rooms (less than 9%) might be explained by the geographic location of psychiatric hospitals, which are outside the city core (by approximately 10 km). In addition, this low level of psychiatric emergency room visits might be explained by the fact that psychiatric hospitals' emergency rooms have traditionally redirected some patients who arrive at the emergency room in a state of intoxication to general hospitals. These patients generally use the services of downtown general hospitals, which are closer to where they live (sectors with high drug utilization and a concentration of itinerant population).

The significant rate of utilization of outpatient clinics in psychiatric hospitals would indicate there is a referral system to specialized clinics of these psychiatric hospitals. Thirty percent of outpatient clinic visits were in one of the two Montreal university psychiatric hospitals, probably because this institution specializes in psychoses and offers a specialized clinic for comorbidity. On the other hand, more than three-quarters of the hospital days spent in acute-care and specialized units were in general hospitals, which often do not have integrated programs for the treatment and management of comorbidity.

The cluster analysis resulted in four groups. Group 1 consists of patients diagnosed exclusively with drug-induced psychoses (lowest severity), where there is a very low rate of service utilization. Group 2, with the highest prevalence of drug dependence and alcohol dependence syndrome and a higher prevalence of drug-induced psychoses, schizophrenic psychoses, affective and manic-depressive psychoses, presents a high level of service use without outpatient visits. Group 3, with a high prevalence of alcoholic, affective and manic-depressive psychoses, is characterized by a higher rate of visits to outpatient clinics (where patients are followed) but a low emergency room utilization (0.76 visits). Group 4, with more than 90% of patients presenting with a diagnosis of schizophrenic psychosis associated with affective and manic-depressive psychoses, presents the highest use of diverse services.

Group 3 of the cluster analysis confirms the importance of following patients. The high rate of outpatient clinic attendance in Group 3 might be explained by the management of these patients within an integrated program of specialized services that requires a utilization that is intense but appropriate for effective treatment (Grella & Stein, 2006), since there is a low utilization of emergency services among this group. Continuity and comprehensiveness of care appear to be required because of the complexity of needs of patients with co-morbidity.

Analysis of the data shows that these patients have greater access to private practices. While this utilization represents an access to first-line services, some patients who are drug dependent might prefer to consult in private clinics where certain medications, such as benzodiazepines, are more easily prescribed. Group 2 confirms this hypothesis. Patients in this group frequently use private clinics and present with

drug dependence and alcohol dependence syndrome. This highlights the necessity of developing strategies for raising awareness among primary care physicians, particularly those in private practice.

Cluster analysis permits the extraction of diagnostic and socio-demographic profiles that are well known to psychiatrists and consistent with clinical practice. Group 1 would consist of patients in a first episode of care; Group 2, of patients identified as having a comorbidity and moving toward stabilization; Group 3, of patients who have been stabilized; and Group 4, of the more severe cases. In addition, the exclusive presence of drug-induced psychosis and/or female gender each indicate very low utilization of health care services by patients. However, 50% of these patients will experience deterioration of their status over the course of their life.

We have brought to light the existence of a small group (Group 4) of major consumers of health care services (less than 5% of the patients), who frequently use many different types of services. This is probably a sub-group made up of a particularly complex clientele who do not receive adequate services for their problems and are who are tossed around in the network.

The existence of schizophrenic psychoses associated with both affective and/or manic-depressive psychoses (bipolar disorders) and with substance use disorders results in an extensive use of all health care services. In fact, patients with bipolar disorders experience more episodes of extreme depression or depression combined with manic episodes (Simon et al., 2004; Sonne, Brady, & Morton, 1994). These episodes explain the high rate of hospitalization and of utilization of health care services overall.

Conclusions

This methodological approach (the cross-referencing of diagnoses) permits fairly precise estimates of the prevalence of co-occurring psychoses and substance use disorders in Montreal. Until now there have only been approximations of this prevalence in some psychiatric and addiction services. It should be noted that a large number of the cases identified include patients who have probably never specifically been attributed a comorbidity. Cross-referencing the diagnoses of mental illness and substance use disorders allowed us to better understand the prevalence of this phenomenon.

The analysis confirmed a relatively high utilization of emergency services and hospital admissions for mental health problems in the population of patients with co-morbidity. This is most likely explained by clinical complexity, but is also evidence that these patients are not treated according to good clinical practices. This recommends a comprehensive and integrated approach that deals with both diagnoses.

Cluster analysis allowed the extraction of certain clinical profiles associated with specific service utilization patterns. These demonstrate the heterogeneity within the group of patients with co-occurring mental illness and substance use disorders.

Comorbidity patients with drug dependence and alcohol dependence are very heavy users of emergency services and private practices. Raising awareness among physicians in private practice would probably help to improve management of this clientele.

Some patients present low emergency room utilization despite the complexity of their disorders because they are being followed (higher rate of visits to outpatient clinics). This underlines the need for better management of such patients to reduce utilization of emergency services.

These results suggest that strategies for reorganizing health care services should take into consideration the clinical profiles and sites of service utilization (including emergency

rooms and outpatient clinics) among patients with a co-occurrence of mental illness and substance use disorders.

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Notes

1. The ICD-9 codes used for drug-induced psychoses are: 292.0, 292.1, 292.2, 292.8, 292.9. Drug-induced psychoses are the only codes that characterize both a mental health disorder and drug use. We are considered these codes as indicators of low-severity co-morbidity when not associated with other mental disorders. Of the 1804 patients with drug-induced psychoses, 854 did not present a diagnosis of any other mental health disorder.
2. The CIM9 codes that refer to severe mental illnesses are: schizophrenic psychoses (2951, 2952, 2953, 2954, 2956, 2957, 2958, 2959); affective psychoses and manic-depressive psychoses (296.0, 296.1, 296.2, 296.4, 296.5, 296.6); personality disorders (301.0, 301.2). The codes used for drug addiction are: alcoholic psychoses (291.0, 291.1, 291.2, 291.3, 291.5, 291.8, 291.9); alcohol dependence syndromes (303.9); drug dependence (304.0, 304.1, 304.3, 304.4, 304.5, 304.6, 304.7, 304.8, 304.9); drug abuse in non-dependent people (305.0, 305.1, 305.2, 305.3, 305.4, 305.5, 305.6, 305.7, 305.8, 305.9; 648.3).
3. Cluster analysis is a method of statistical analysis that enables the classification of individuals into different homogeneous groups according to variables.

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