

Use of psychotropic drugs in prison (Madrid III Penitentiary centre)

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ABSTRACT

Use of psychotropic drugs in the framework of primary care is exponentially increasing and prisons are not an exception to this trend. These drugs are quite often prescribed in order to find therapeutic uses in the fields of personality disorders, addictions, and dysfunctional behaviours that have not been accepted as indications (compassionate use). This study has permitted a detailed description of the use of psychiatric drugs at the Madrid III penitentiary, one of the centres with lower expenditure for medicines in our Community. During a two-week period, all prescriptions of psychotropic drugs were collected and registered along with data of several possible conditioning factors. 20,5% of the population was receiving some kind of psychiatric drug; 76% of those inmates undergoing treatment were receiving one or two psychotropic drugs; 65% were taking an anxiolytic, 38% antidepressants and 27% an antipsychotic. The total amount of psychotropic consumed was 9.840 DDDs, 46% of which were anxiolytic, 17% antidepressants and 14% antipsychotic. The total cost of those two-week treatments was 5.379 euros, 72% of which was spent on antipsychotics (3.857 euros). There are signs that compassionate use of new generation's antipsychotics and antiepileptics are a main cause of the substantial increase in the costs, not always with well-demonstrated cost-efficiency. One of the key factors that has more influence over the amount, type and cost of the treatments was the prescriber. An unexpected result was finding no association between the variables age, nationality, type or degree of sentence and prescription of different sub-groups of psychiatric drugs with the exception of benzodiazepine.

Key words: Psychotropic Drug, Utilization, Primary Health Care, Prison.

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INTRODUCTION:

Interest regarding the condition of mental illnesses in prisons today has been growing in the last two decades.

Although Gunn's work on the need for psychiatric health care in prisons in England and Wales in 1991 (1) was the starting gun for research in this field, the idea originated from a British psychiatrist who in 1939 gave his name to the “Penrose's law”, a theory which postulated an inverse relationship between the number of mental hospital beds and the number of prisoners. Since then, multiple studies on the prevalence of mental illnesses and associated problems have been carried out in all the prisons in the so-called

“first world”. Fazel's meta-analysis conducted in 2002 serves as a reference (2).

Common to all these prisons is the higher prevalence of all the categories diagnosed in comparison with all those observed in the general population. The most significant difference is the contrasting figures found in the frame of personality disorders (a category which raises doubts among the stricter fields of nosology) and that of addictions (according to the substances included).

The prescription of psychiatric drugs is the principal treatment administered for mental health complaints in the prison setting (3). According to recent data, between 13,5% and 25% of inmates are receiving psycho-pharmacological treatment in other coun-

tries (4, 5, 6). In our country, a study carried out in 1998 reported that 28% of the population in the prison of León were taking some kind of psychotropic drugs (in comparison to 7,6% of the general population in the same region). A similar percentage was found by Espinosa in Catalan centres in 2003 (7,8).

These last years, the scientific literature has taken for granted the victory over the initial controversy regarding the possible use of these substances as a punishment or threat, but a hypothetical high consumption is now raising the alarm. Therefore, the focus of attention is now the comparative analysis of quantity, costs and types of psychiatric drugs uses between the prison setting and the general population as well as the evaluation of the appropriateness of the prescription and the potential for rationalization of expenditure.

Pharmaco-economical aspects such as the efficiency of radically substituting classical drugs for new generation drugs in the treatment of depression or psychosis (9) together with the relevance of using modern antiepileptics or neuroleptics, among other drugs, in indications that have not yet been approved by international pharmacovigilance organisms, although they are very common practices (10), are on the table.

There are various factors contributing to the high consumption of psychiatric drugs in prisons:

- The obvious “psychiatrization” of psychiatric reactions to life’s events and that of criminal acts as a socio-cultural phenomenon is not an exception in prisons.
- The increasing prevalence of mental illnesses in the prison setting (11, 12, 5).
- The characteristics of how the prison health care system functions (13), for instance the great accessibility to medical consultations and the greater possibilities of detection and follow-up, in a closed setting, (with the possibility to supervise intakes).
- A very high comorbidity of substances abuse which conditions the excessive demand for those drugs and which could give rise to a compassionate prescription associated not only with a physician-patient conflict but also with the general level of tension within inmates (14).
- The current proliferation of new therapeutic uses for new generation drugs in the field of dysfunctional behaviours associated with personality disorders, a diagnosis that in prisons has gone from being common to reach up to 80 % of prevalence (15); or as anti-impulsive or anti-crav-

ing medication in substance abuse associated problems.

The discussion regarding the appropriateness of the types of psychiatric drugs current uses in this setting does not only take the economical aspects into consideration, even though it is an urgent problem. Considering the global cost-efficiency framework, different authors have reported that most pharmacoeconomical evaluations in favour of new antipsychotics use (principally responsible for the considerable increase in costs) have a methodological bias and do not study the impact of secondary effects well enough (16, 17, 18, 19), an aspect which should carefully be taken into consideration when using a drug for an indication which has not been proved (for example when using an antipsychotic as a hypnotic or as an anti-impulsive). This is the issue that takes us back to the “key question”. Does the increase of the psycho-pharmacological cost in the prison setting really correspond to better health care for inmates? The first step in order to find the answer to this question would be to obtain detailed information with respect to which, how much and how to prescribe in this environment.

MATERIAL AND METHOD:

We would like to present a descriptive cross-sectional epidemiological study carried out among the population of Madrid III penitentiary centre. Our objective is to describe the use of psychiatric drugs without causing any alteration with respect to the normal functioning of the prison.

Psychiatric drugs are defined as drugs belonging to the group of anxiolytics, hypnotics, antidepressants, antipsychotics or antiepileptics.

A period of study of two standard weeks in the health care calendar was established. Only inmates from the Open Section and those staying 48 hours in transit in the juvenile centre have been excluded. On 6-6-05, all the current treatment record sheets including psychiatric drugs had been collected. The rest of new prescriptions, treatment interruptions and changes between the 7 and the 19 of June, both days included, have been collected every day during the study. Information related to inmates in transit (those coming from other prisons and who are passing through) and admissions has been collected by means of a specific protocol. All these data have been computerized in an Excel file taking into account the following variables: inmate’s security identification

number, which was deleted once the database had been depurated in order to preserve the participants privacy; inmate's unit; prescribed active principle; total daily doses in milligrams; starting date; date of suspension; in transit or permanent. According to the starting dates and dates of suspension of treatment, the following variable was created: "duration of prescription in days" for the period studied (maximum 14 days).

Every unit has a permanent primary care physician assigned, therefore the variable Unit provides us with indirect information from the prescriber. Besides, a variable has also been created in order to define whether the psychiatrist has checked the prescriptions by means of the list of consultations from the previous year.

By means of the prison information system, the dates of birth corresponding to the security identification numbers of inmates taking psychotropic drugs were identified and the variable age together with epidemiological data such as nationality, penal situation (convicted or preventive) and degree were included.

Active principles have been codified again in 5 therapeutic sub-groups (anxiolytics, hypnotics, antidepressants, antipsychotics and antiepileptics). In order to determine the DDD (Defined Daily Doses), reference values for each active principle according to the Nomenclator Digitalis database updated in 2005 have been used. To determine the costs, prices corresponding to the most economical offers of active principles received in pharmacy from the beginning of 2005 until the start of this study have been used. The number of DDDs corresponding to each prescription was calculated by multiplying the product of the daily doses in milligrams by the value of DDD assigned to each active principle in the above-mentioned official classification. Finally the Daily Inhabitants Doses (DID) was calculated by means of the following formula: $DID = (\bullet DDD \text{ in } 14 \text{ days} / 1368 \times 14) \times 1000 \text{ inhabitants}$ (with 1368 being the total number of inmates at the mid point of the study).

Relating to the **statistical analysis**: qualitative variables were presented with their frequency distribution and confidence interval of 95%. The quantitative variables were expressed as mean and standard deviation (SD) or as median and interquartile rank (IR) in case they did not follow a normal distribution. In order to compare the qualitative variables, the Pearson's chi square test was used as well as the Fisher's exact test when the frequency expected was inferior to 5 in more than 25% of cases. In order to verify that quantitative variables did not differ, the Kolmogorov Smirnov and the Shapiro Wilk tests have

been used. To compare the quantitative variables, the Student's t-test was used in case of normal distribution and the median test was used for variables expressed as median and IR. In all the hypothesis testing, the level of significance was set at 5% ($p < 0,05$). The computer programs used for the analysis were SPSS v.12 and CIA.

RESULTS:

The study population consisted of 1099 permanent inmates and 268 inmates in transit, therefore, in two weeks of research, data of a total of 1368 inmates were included. 23,46% of this population were prescribed a psychiatric drug (confidence interval of 95% = 21,29%-25,78%).

Using the 06/06/05 as the cut-off, 15,5% of the prison population had received an evaluation by their psychiatrist at some point in the previous year (confidence interval of 95% = 13,4%-17,8%). Among this 15,5%, a percentage difficult to know with any precision was not taking any psychiatric drugs any longer.

Figure 1 illustrates the distribution of inmates undergoing treatment according to the number of psychiatric drugs prescribed per individual. 76% of inmates taking some kind of psychotropic drugs (confidence interval of 95% = 65,8%-86,7%) were taking one or two (for example, an antidepressant and a hypnotic). Between June 6 and June 19 2005, 639 psychiatric drug prescriptions were recorded on the treatment sheets. The total consumption in DDDs that represented these prescriptions reached 9839.74 DDDs, which transcribed to DID (Daily Inhabitant Doses) corresponded to 513.77 DDDs per 1000 inmates per day.

Table 1 shows the distributions of inmates undergoing this type of treatment as well as prescriptions recorded during the two weeks of research according to sub-groups of psychiatric drugs. The reason why the percentages of inmates taking medications of different sub-groups do not sum up 100% is that an inmate can accumulate prescriptions of different psychiatric drugs (for example an anxiolytic and an antidepressant, as a result this individual would be included not only within the 37,7% of inmates undergoing treatment with antidepressants but also within the 65,1% of inmates taking an anxiolytic). The two most prescribed sub-groups of psychiatric drugs are anxiolytics and antidepressants according not only to the percentage of inmates taking them but also the number of prescriptions. 27,4% of inmates

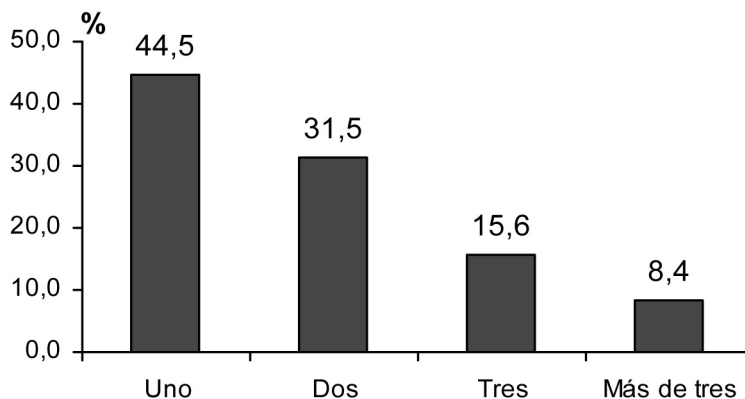


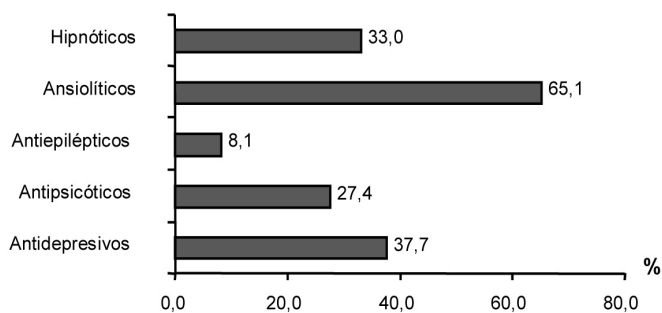
Figure 1. Distribution of inmates undergoing treatment according to the number of psychiatric drugs prescribed per individual.

receiving some kind of psychiatric drugs are taking an antipsychotic and the sub-groups of anxiolytics and hypnotics (mostly benzodiazepines) account for more than half of the prescriptions (56,1%).

In the distribution of prescriptions according to sub-groups and active principles (table 2) the following substances stand out:

- Within the antidepressants, Amitriptyline is the most commonly prescribed medication followed closely by Mirtazapine (both active principles represent 49,6% of all the treatment orders with antidepressants recorded during the period studied). Paroxetine represents 18,6% of prescriptions, and comes third in percentage.

Psychiatric drug	Inmates	%	CI 95%
Antidepressants	121	37,7	32,6-43,1
Antipsychotics	88	27,4	22,8-32,5
Antiepileptics	26	8,1	5,6-11,6
Anxiolytics	209	65,1	59,7-70,1
Hypnotics	106	33,0	28,1-38,3
TOTAL	321		



Psychiatric drug	Prescrip.	%	CI 95%
Antidepressants	129	20,2	17,3-23,5
Antipsychotics	120	18,8	15,9-22,0
Antiepileptics	32	5,0	3,6-7,0
Anxiolytics	247	38,7	35,0-42,5
Hypnotics	111	17,4	14,6-20,5
TOTAL	639	100%	

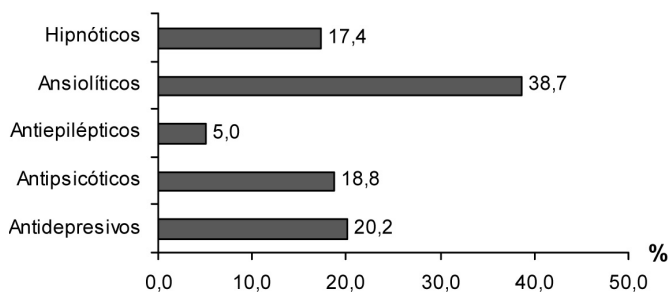


Table 1. Distribution of inmates and prescriptions according to the sub-groups of psychiatric drugs.

Psychiatric drugs	n	%	Psychiatric drugs	n	%
ANTIDEPRESSANTS			ANTIPSYCHOTICS		
Amitriptyline	33	25,6	Amisulpride	1	0,8
Citalopram	4	3,1	Clotiapine	4	3,3
Clomipramine	1	0,8	Haloperidol	6	5,0
Escitalopram	2	1,6	Levomepromacine	8	6,7
Fluoxetine	17	13,2	Lithium	5	4,2
Mirtazapine	31	24,0	Olanzapine	32	26,7
Paroxetine	24	18,6	Perphenazine	1	0,8
Sertraline	5	3,9	Quetiapine	18	15,0
Trazodone	3	2,3	Risperidone	16	13,3
Venlafaxine	9	7,0	Risperdal Consta	13	10,8
Total	129	100,0	Sulpyrid	2	1,7
ANTIPILEPTICS			Tiapid	2	1,7
Carbamazepine	3	9,4	Ziprasidone	1	0,8
Gabapentin	14	43,8	Zuclopenthixol	5	4,2
Oxcarbazepine	2	6,3	Zuclop. Depot	6	5,0
Topiramate	13	40,6	Total	120	100,0
Total	32	100,0	HYPNOTICS		
ANXIOLYTICS			Chlormethiazole	1	0,9
Alprazolam	5	2,0	Doxylamine	7	6,3
Bromazepam	27	10,9	Flurazepam	6	5,4
Clonazepam	41	16,6	Lormetazepam	76	68,5
Clorazepate	50	20,2	Midazolam	2	1,8
Diazepam	53	21,5	Zaleplon	13	11,7
Diazepam + Sulpyrid	3	1,2	Zolpidem	5	4,5
Ketazolam	11	4,5	Zopiclone	1	0,9
Lorazepam	27	10,9	Total	111	100,0
Medazepam	27	10,9			
Hidroxyzine	3	1,2			
Total	247	100,0			

Table II. Distribution of prescriptions according to sub-groups and active principles.

- Within the group of antipsychotic drugs, prescriptions are better distributed within the different substances. However, Olanzapine represents up to 26,7% of treatment orders, followed by Quetiapine (15%) and Risperidone (13,3%). Those three medicines together account for 55% of psychiatric drugs prescriptions.
- Within the antiepileptics with potential use in psychiatry, Gabapentine and Topiramate account for 84,4% of prescriptions.
- Within the sub-group of hypnotics, the fact that more than 68,5% of treatment orders correspond to lormetazepam is significant.
- Within the anxiolytics, prescriptions are better distributed and none of the active principles presents percentages that reach 25%. Therefore the

most commonly prescribed substances are Diazepam (21,5%), Clorazepate (20,2%) and Clonazepam (16,6%).

Regarding the different active principles, significant differences have been found (Kruskal-Wallis median test) within mean doses used during the 14 days of study (always taking the DDDs as a reference, defined daily doses used in their main indication). Regarding antidepressants, differences ($p=0,003$) varied from an average of 9.8 DDDs within tricyclic antidepressants (which means that mean doses for this type of drugs is slightly lower than defined daily doses in their main indication as antidepressants) and an average of 16 DDDs within Venlafaxine, taking into account that 15 DDDs is the average that corresponds

Unit	Total €	Median	P ₂₅	P ₇₅
Antidepressants	608,72	6,30	1,80	7,28
Antipsychotics	3856,74	14,17	2,55	45,78
Antiepileptics	442,53	10,17	6,68	16,28
Anxiolytics	341,89	0,67	0,38	1,44
Hypnotics	108,26	0,56	0,28	0,93

* Median Test (global): $p < 0,0001$

Table 3. Distribution of expenditure (€) according to the sub-groups of psychiatric drugs.

to SSRI antidepressants (the closest to 14 DDDs that correspond to a two week's doses adapted to that recommended for depression). Regarding the antipsychotics, differences ($p < 0,001$) are even more important and mean values of 5.1 DDDs were found for Quetiapine, 6.3 DDDs for Risperidone and 14.1 DDDs for Olanzapine. With respect to anxiolytics, contrast was also significant ($p < 0,001$) with considerable variations such that of an average of 40.4 DDDs for Alprazolam and 5,6 for Diazepam. Mean doses of antiepileptics also showed significant differences ($p = 0,008$): 5,3 DDDs for Carbamazepine and Oxcarbazepine; 8.4 DDDs for Gabapentine and 4.7 for Topiramate.

Regarding the distribution of prescriptions according to sub-groups of psychiatric drugs, the variable associated to the most significant differences was the variable unit. With respect to inmates receiving psychiatric drugs treatment, no statistically significant association has been found between individual variables such as mean age, nationality, degree of type of sentence and whether one is undergoing treatment with an antidepressant, an antiepileptic or with an hypnotic. Only within antipsychotics, mean age of inmates receiving this type of medication (35.5 years of age) was significantly lower than that of inmates receiving some other type of psychotropics (39.9 years of age). Within anxiolytics, significant differences ($p = 0,002$ and $p = 0,04$) were found with respect to the percentage of prescriptions according to type and degree of sentence in favour of convicted inmates in comparison with those on remand and those classified as first or second degree compared to other categories.

The unit in which inmates were incarcerated was also significant not only regarding the type of psychotropic they were prescribed: an antidepressant ($p = 0,05$), an antipsychotic ($p < 0,001$), an hypnotic

($p < 0,001$) but also regarding the probability that a specialist had checked the prescription and regarding the mean price of the medication supplied as well.

Total cost of psychiatric drugs corresponding to the two weeks of study amounted to 5.379.27 Euros. As showed in table 3, significant differences ($p < 0,001$) were found within the expenditure medians during the period of study in the different sub-groups of psychiatric drugs. Expenditure in antipsychotics (3.856.74 Euros) accounts for 71,7% of the total cost of psychiatric medication prescriptions and corresponds to treatments supplied to 88 inmates. Expenditure in antidepressants follows closely (608.72 Euros) with a total of 121 inmates who have received this type of medication. Next we have antiepileptics, a sub-group whose cost amounts to 442.53 Euros and which has been prescribed to 32 individuals. The cheapest group corresponded to the anxiolytics and hypnotics (both together represent 7,4% of total cost in psychiatric drugs during the period studied).

DISCUSSION

Expenditure in neuroleptics through centralized purchasing (Risperidone and Olanzapine) according to inmate per month has experienced an annual increase of 59,36% compared to 2003 in Spanish prisons (data extracted from the Penitentiary Institutions Annual Pharmacy report). Since the price of these medications has not increased, there are two possible explanations to this phenomenon: a massive entry of individual suffering from psychosis that year or antipsychotics have been prescribed more often in different utilizations than that of their authorised indication. It is no surprise, considering that a similar phenomenon is happening with other sub-groups of psychiatric drugs (among which new antiepileptics

can be pointed out), that in February 2006 the Sub-directorate General for Prison Health sent a circular letter (10) regarding the use of antiepileptics and antidepressants in unauthorised indications in the product specifications.

Although this centre receives a high number of inmates from other centres (with significantly higher quantities of psychiatric medication prescriptions than its permanent population) Madrid III comes in the 20th position with respect to lower pharmacology expenditure through centralized purchasing (with in a total of 64 prisons) and expenditure in neuroleptics was reduced, in contrast to the general trend, in 2004 compared to 2003 in 7,10%. Even then, the study we are dealing with show that expenditure in psychiatric drugs during the two weeks evaluated could amount to up to 140.237 euros if this trend continued along the whole year.

Which are the possible factors involved in the overly high increase in psychiatric drugs use in the prison setting? Which conditioning factors enable a centre to carry out a better expenditure management?

Since this is a merely descriptive study, it is not possible to draw conclusions regarding causal relationships; however results point to some new evidence and associations.

The percentage of inmates undergoing psychopharmacology treatment in Madrid III is slightly inferior to that found in other Spanish centres according to these last years' research, however the difference hardly reaches 5%. An important proportion of individuals who receive this type of medication only take one or two drugs, essentially an anxiolytic, a hypnotic or both of them (the use of multiple medications is diminishing, which is an indicator of quality). The most important difference (with respect to expenditure) between our centre and others is likely to be the lower proportion of inmates undergoing treatment with new generation's antipsychotics and antiepileptics in compassionate use since these groups represent a considerable percentage of the costs (only two medications, Olanzapine and Risperidone, account for 52% of the total, 2.814 Euros, despite the fact that they only amount to 7 % of prescriptions).

Even though the study did not collect information associated with indication or diagnosed categories, there is clear evidence that compassionate use is a usual practice in this setting:

- The proportions of inmates undergoing treatment with antipsychotics and especially antiepileptics are more important than those corresponding to the estimate prevalence of psy-

chosis and epilepsy in the prison setting (practically the only indications approved).

- Regarding the ranking of the most used antidepressants and antipsychotics, substances which are not first-choice medication for the treatment of these patterns occupy the very first positions, such as Amitriptyline or Mirtazapine (with respect to the first group) or Quetiapine (within the second group).
- Mean doses used of most new generation's antiepileptics (Topiramate and Gabapentine) some antidepressants (Amitriptyline and Mirtazapine) and antipsychotics (Quetiapine and Risperidone) are much lower than daily doses recommended for their main indication.
- The proportion of new generation's antipsychotics prescriptions that have been checked by a psychiatrist (19%) was significantly lower compared to that of anxiolytics or antidepressants (30% and 39% respectively), maybe due to the fact that compassionate use of antipsychotics does not relate to severe clinical patterns (such as psychosis), that explains why physicians do not derive patients to a specialist (for example, when prescribing Quetiapine in small doses as a hypnotic).

Furthermore, various limitations with respect to obtaining conclusive results were found. The most important limitation may be that this work did not allow comparisons between the prison population who was not taking psychiatric drugs and the population who was taking them. This is the reason why most of comparisons have been carried out between inmates who were receiving one type of medication (for example an antidepressant) and the rest of individuals undergoing treatment. Other limitations were associated with the initial objective of not introducing any type of modification with regard to the prescription patterns or in the dynamic of data collection which could distort the results. Therefore, defects of the usual registry methods have been a conditioning factor as the variable prescriber has not been collected as such and the percentage of incomplete data associated with inmates in transit was higher. However, the conviction that individual treatment records should be used instead of "artificial" registry means is also the great strength of this work aimed at obtaining more detailed information and more focused on the inmates undergoing treatment since in many other studies data regarding use and costs were extracted from the pharmacy annual purchase orders, with the inaccuracy consequently involved.

One of the newest results is about the possible associations of variables regarding the individual (epidemiological or penal associations) with different sub-groups of psychiatric drugs prescription. Previous studies reported significant associations within variables such as the type or the degree of sentence and the probability of receiving psychopharmacology treatment and nationality also seemed to have an influence on prescriptions as well in our centre. Comparisons were carried out within the different sub-groups (antidepressants, antiepileptics, antipsychotics...) and significant differences have only been found for antipsychotics (associated with mean age of inmates who were receiving them) and for benzodiazepines whose patterns were very similar to those found in other studies regarding psychiatric drugs in general.

This discovery could indicate the existence of a bias derived from multiple medication records which could explain the repetitive association of penal variables with the psychiatric medication intake, since anxiolytics are in all the studies the first category in the ranking according to use. Nationality, in contrast with our expectation, did not show any association with one or other sub-group of psychiatric drugs prescriptions.

Although the discovery above-mentioned is new, there are no doubts that the most notable result of this study is altogether different, and in fact it has consequences which, if confirmed in specifically designed studies, would be very important for the design of any expenditure rationalization policies.

Results point to the primary health care physician (indirectly collected in the variable unit) as the key component who plays a decisive role with respect to what, how much, how (under psychiatric supervision or not) and what price psychiatric drugs are prescribed.

More often than not, his management work remains out of the spotlight and the administration does not recognize nor sufficiently offer incentives, so it is left up to chance or his own personal interest that he carries out this substantial role in an environment, which is sometimes overwhelming, with growing difficulties for the provision of minimum staff or health professional who are indispensable to provide medical care to the population. This environment in which psychiatrization of disruptive behaviours can "kidnap" scandalously high percentage of the budget with very doubtful benefits and not sufficiently valued risks for health.

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