Estimation of psycholeptic and psychoanaleptic medicine use in an adult general population sample using the Anatomical Therapeutic Chemical classification

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Abstract

Little is known about psycholeptic and psychoanaleptic medicine (PM) use in the general population. This study presents prevalence data about PM use. The sample included 4310 individuals aged 20–79 from a general population health examination in a northern German area (participation proportion: 68.8%; Study of Health in Pomerania, SHIP). Medicines taken during the past seven days were assessed from the medicine packages or self-reports and classified according to the Anatomical Therapeutic Chemical (ATC) classification developed by the World Health Organization. In total, 6.3% of the sample reported PM intake, 8.7% of the women and 4.7% of the men. During the past 12 months prior to the health examination, 49.2% of the individuals with PM use consulted a general practitioner but not a neurologist or a psychiatrist. Among the study participants with PM use, 88.8% had one or more mental disorders during lifetime according to a screening questionnaire. It is concluded that considerable proportions of individuals with current PM use exist although lower than may be expected on the basis of the number of individuals with mental disorder in the general population. Copyright © 2008 John Wiley & Sons, Ltd.

Key words: psychotropic medicines, psycholeptics, psychoanaleptics, prevalence

Introduction

Little is known about psycholeptic and psychoanaleptic medicine (PM) use in the general population regardless of whether a mental disorder had been diagnosed or not. Even less is known from general population studies that record all drugs taken by the individual irrespective of their indication. However, population-based studies could contribute to reduce reporting bias. Such a bias may originate from responses to questions for the purpose of medicine intake, e.g. support of sleep, reduction of depressive or other psychological disorders. Such

filter questions could obscure that the individual may take medicines without having knowledge of the reason why they have been prescribed. Among the studies that detected information about all medicines taken by the respondent, the Danish Health and Morbidity Survey 2000 (Nielsen et al., 2004) revealed that 7.2% of the 7336 participating women aged 25 or older, and 3.9% of the 6979 participating men aged 25 or older reported to regularly take PM according to the code of Anatomical Therapeutic Chemical (ATC) classification of the World Health Organization (ATC N05, N06, Nielsen

et al., 2004; WHO collaborating centre for drug statistics methodology, 2008). Antipsychotic medicines (ATC N05A) were not analyzed due to a small number of users ($n = 162$). The proportions for PM users in total and for users of antidepressants, anxiolytics, hypnotics or sedatives tended to be higher in the elderly (Nielsen et al., 2004), they were revealed to be particularly prevalent among the population aged 75 or older (Hartikainen et al., 2005).

Patterns of PM use by education and income seem to be largely unclear with respect to PM intake (Nielsen et al., 2004). Individuals with 10 years of education or less reported the highest and those with 13 or more years of education the lowest proportion of PM use (Nielsen et al., 2004). One limitation of the study was that in Denmark antidepressant (ATC N06A) and antipsychotic medicines (ATC N05A) were eligible for reimbursement when the study was carried out whereas other PMs (ATC N05B, N05C) were not (Nielsen et al., 2004).

A high proportion of individuals with PM use may be expected among the general population since mental disorders are highly prevalent in many countries when estimated on grounds of standardized psychiatric interviews, such as the Composite International Diagnostic Interview (CIDI, Robins et al., 1988). However, proportions of treated individuals among those with mental disorders are low. A review of general population data using the CIDI in Canada, Chile, Germany, the Netherlands, and the US revealed proportions of individuals who had received any treatment of mental disorders among all respondents during the past 12 months prior to the interview from 7.0% in Canada to 20.2% in Germany (Bijl et al., 2003). In the US, among a general population sample, 20.1% of all respondents received any treatment for an emotional disorder during the 12 months prior to the interview in 2001 to 2003 (Kessler et al., 2005). However, among those who received psychopharmacological treatment not all may be expected to take the medicaments prescribed. In a sample from six western European nations (Alonso et al., 2004b) only 12.3% of the total sample reported having taken one or more psychotropic drugs (antidepressants, anxiolytics, antipsychotics, mood stabilizers) during the past 12 months prior to the interview. Among those with any mental disorder in the last 12 months, 32.6% reported psychotropic drug use during the same period (Alonso et al., 2004a).

Taken together, more research is needed about PM use according to ATC classification from general population samples. We examined the proportion of individuals with PM intake among a general adult population sample: (1) by sex, age, school education, and income, (2) by contact to a neurologist or psychiatrist and further health care use, and (3) by a screening for mental disorders.

Methods

Sample

Data from the Study of Health in Pomerania (SHIP) was used (John et al., 2001). The target population were German residents of West Pomerania in northeastern Germany. The study area comprised three cities and 29 communities with a total population of 212,157 in 1996. A multistage sampling scheme was adopted from the World Health Organizations MONICA project, Germany (Evans et al., 2001). From the total population, a random sample of 7008 residents who were 20 to 79 years old was drawn from the residents' registration office files of the State of Mecklenburg-West Pomerania following stratification by gender and five-year age strata (John et al., 2001). The sex and age data were provided by the residents' registration office. The net sample (after exclusion of migrated or deceased persons) comprised 6267 eligible subjects, out of which 4310 persons participated, corresponding to a participation rate of 68.8%. Among the participants, 20 had no or unfinished interview or incomplete data or refused to answer the questions for recent use of medication, leaving 4290 subjects as our final sample. The project was approved by the human research ethics committee of the Medical School at the University of Greifswald.

Data were collected between 1997 and 2001, with respect to the individual's medical history, including health care utilization and social and behavioral risk-factors by computer-assisted personal interviews and self-report questionnaire. The interviews were conducted as part of the medical examinations, for which the participants were invited to the university hospital. All participants gave informed consent to the study and scientific use of the data.

Assessments

Medicament intake during the past seven days prior to the interview was assessed in three steps: (1) medicament intake data were gathered, (2) the medicament

was identified using the German drug databases, (3) the code of the ATC classification was provided for the medicament. Medicament intake data were gathered by interview. Prescription and non-prescription drugs, including homeopathic substances and dietary supplements were assessed. The study participants were asked: 'During the last seven days: have you taken any medication such as tablets, drops, suppositories, or have you had any injection?' If this was the case, every compound was recorded. In addition to the interview we had asked the participants to bring the packages or an intake plan of all medications which they had been taking during the last seven days prior to the health examination. If the individual had done so we used the information on the medicament package or the medicament intake plan. The medicament was identified using the German central pharmaceuticals number (original pharmaceuticals number), a unique identification code. This code was linked with the German drug databases. There are two drug databases which are widely used by pharmacists and scientists in Germany: the database (version November 30, 2001) of the Research Institute of the Health Insurance Company AOK (WidO) and the database of the Federal Pharmacists' Association (ABDA, version December 1, 1999). Both databases together cover every compound that is licensed and available in Germany. If the German central pharmaceuticals number was available it was linked directly to the drug databases which provided the exact medicament name. When the pharmaceuticals number was not provided the medicament name was searched in the drug databases. The best fitting medicament was selected, leading to a proxy pharmaceuticals number. The code of the ATC classification (WHO collaborating centre for drug statistics methodology, 2008) was provided by the drug database along with the drug name. The ATC code was selected by a pharmacist based on the information about the medicament that had been available from the study participant if no choice was possible for a specific drug according to the proxy pharmaceuticals number. The ATC is a hierarchical five-level classification system. It includes drugs according to the organ system or system on which they act, and their chemical, pharmacological and therapeutic properties. Among all medicaments, 74% have been identified by proxy pharmaceuticals number, and 19% by original pharmaceuticals number, 6% were coded by ATC classification only, 1% of all medicaments could not be identified.

We defined PM use as having taken one or more substances among psycholeptics or psychoanaleptics (ATC N05 or N06, WHO collaborating centre for drug statistics methodology, 2008) during the past seven days prior to the health examination. Psycholeptics (N05) include antipsychotics (N05A), anxiolytics (N05B), and hypnotics and sedatives (N05C). Among psychoanaleptics (N06) are antidepressants (N06A), psychostimulants (N06B), and anti-dementia drugs (N06D).

We screened for psychiatric disorders using the Composite International Diagnostic-Screener (CID-S, Wittchen et al., 1999), a 12-item questionnaire for depressive, anxiety, somatoform, and substance use disorders during a lifetime (Wittchen et al., 1999). The following screening diagnoses were assessed: somatoform disorder (no, yes), single anxiety disorders (0–5), single affective disorders (0–3), alcohol use disorder (no, yes), medication use disorder (no, yes), recurrent illegal drug consumption (no, yes). The CID-S questions had been taken from the CIDI. The CID-S development study revealed that among individuals who affirmed at least one CID-S item, the sensitivity ranged between 79.0% and 95.2% for the single current Diagnostic and Statistical Manual of Mental Disorders – fourth edition (DSM-IV) disorders covered by the CIDI (Wittchen et al., 1999). School education, outpatient care and inpatient care were assessed by computer-assisted personal interview, income by questionnaire.

Statistical analysis

Proportions, odds ratios (OR) and 95% confidence intervals (CI) are reported. Logistic regression analysis, which provided OR and CI, was adjusted for sex and age groups (18–39, 40–59, 60–79). Logistic regression analysis included psycholeptic or psychoanaleptic medicament use as the dependent variable. For purposes of data analysis we grouped all psycholeptic or psychoanaleptic medicine to the ATC group level three, i.e. the pharmacological subgroup level (WHO collaborating centre for drug statistics methodology, 2008). Independent variables were: school education (<10, 10, >10 years), income (940 € or less, 941–1584 €, 1585 € or more), outpatient care during the last 12 months prior to the health examination [neurologist or psychiatrist, general practitioner (GP) but not neurologist or psychiatrist, other but not neurologist, psychiatrist or GP, no outpatient contact], inpatient care during the last 12 months prior to the health examination (no,

1–9 days, 10 or more days) and CID-S. We calculated the number of CID-S items fulfilled indicating the number of mental disorders: somatoform disorder (item 1), any anxiety disorder (any of items 2–6), any affective disorder (any of items 7–9), alcohol use disorder (item 10), medicament use disorder (item 11), recurrent illicit drug use (item 12).

We used post-stratification weights for sex and age groups of the general population for the proportions given in Tables 1 and 2. For each five-year age and sex stratum of the general population of the study region at the last day of the year 1999 we weighted the age and sex data in our sample for deviation from the general population age and sex data. Statistical analysis was performed using Stata 9.0.

Results

In total, 6.3% of the sample reported PM use (Table 1), 8.7% of the women and 4.7% of the men. According to the single therapeutic substance groups, anxiolytics were taken most often (2.9% of the women and 1.5% of the men), 2.6% of the women and 1.3% of the men used hypnotics or sedatives. Individuals aged 60 years or older at the time of the data collection had the highest proportion (10.2%), and those younger than 40 years had the lowest proportion (3.3%) of PM use. Of individuals with less than 10 years of education 8.1% reported PM intake compared to 5.0% of those with more than 10 years of school education.

Among the individuals with PM use, 42.3% reported that they had consulted a neurologist or a psychiatrist during the past 12 months prior to the health examination, and 49.2% were treated by a GP but not a neurologist or a psychiatrist (Table 2). Among the individuals with use of anxiolytics, hypnotics, sedatives, psychostimulants or antidementia drugs, 35.5% or less had consulted a neurologist or psychiatrist with a corresponding proportion of 51.1% or higher having consulted a GP but not a neurologist or psychiatrist. Among the individuals taking antidementia drugs, 24.6% were treated by a neurologist or a psychiatrist. All individuals with psychoanaleptics use had consulted a physician during the past year prior to the health examination. Two individuals with PM use reported that they have not been treated by a physician during the last 12 months prior to the interview, neither outpatient nor inpatient. One or more mental disorders during lifetime according to the screening questionnaire were found among 88.8% of the PM users. The lowest proportions of

individuals who were screened positive for a mental disorder were found among those who had used hypnotics or sedatives (84.2%) or psychostimulants (85.0%), except for those who had taken antidementia drugs (64.9%).

Women had an OR of 2.3 (1.8–2.9) for PM use compared to men after adjustment for age (Table 3). Individuals at age 40 or older had higher OR for PM use than those at age 20 to 39 after adjustment for sex. Participants aged 60 or older had an OR of 3.9 (CI 2.8–5.4) compared to those aged 20 to 39 after adjustment for sex. Further relations between independent variables and PM use were present after adjustment for sex and age. Individuals with any psychiatric screening diagnoses had higher odds for PM use than individuals without psychiatric screening diagnosis except for anti-dementia drugs (Table 3). Individuals with three or more psychiatric screening diagnoses had higher odds for PM use than individuals with one or two screening diagnoses (OR = 2.8, CI 2.1–3.6). School education and income did not reveal a relation with PM use in general.

Discussion

Three main results of this study merit discussion: (1) According to sex and age, the data support findings from a study that used a data collection approach comparable to ours with similar proportions of PM intake in the general population (Nielsen et al., 2004). (2) Our data do not support differences in PM use by education found in a former study (Nielsen et al., 2004). (3) The majority of PM users reported no contact to a neurologist or psychiatrist during the past 12 months prior to the interview.

The proportion of individuals with PM use was revealed by the data to be 6.3% among this general population sample. This supports former findings from the Danish Health and Morbidity Survey (Nielsen et al., 2004) although our sample was limited to age 20 to 79. Both studies revealed higher proportions for women than for men. The proportion of individuals with PM intake is higher at age 40 to 79, particularly among participants aged 60 to 79, than among adults younger than 40. This finding clearly supports former evidence (Hartikainen et al., 2005; Nielsen et al., 2004).

A trend towards a relation between education and PM use was not confirmed by the adjusted data analysis (Nielsen et al., 2004). The results suggest that when controlling for age and sex, no relationship is present

Table 1. Psycholeptic or psychoanaleptic medicine use during the last seven days (in percent)

	N estimated	Psycholeptics or psychoanaleptics	Psycholeptics (N05) ¹				Psychoanaleptics (N06) ¹			
			N05		N05C Hypnotics, Sedatives		N06A or N06B		N06B	
			Total	N05A Antipsychotics	N05B Anxiolytics			Antidepressants	Psychostimulants	N06D Antidementia
Total	4294	6.3	4.3	1.0	2.1	1.8	2.6	1.8	0.9	0.9
Men	2543	4.7	3.2	0.9	1.5	1.3	2.0	1.2	0.9	0.9
Women	1751	8.7	6.0	1.1	2.9	2.6	3.4	2.6	0.8	1.0
Age										
20–39	1302	3.3	2.4	0.4	1.4	0.9	1.0	0.9	0.0	0.1
40–59	1615	5.4	4.0	1.0	2.2	1.2	2.2	1.8	0.4	0.2
60–81	1376	10.2	6.5	1.6	2.6	3.4	4.6	2.5	2.1	2.6
School education (years)										
<10	1701	8.1	5.7	1.4	2.5	2.6	3.1	1.9	1.2	1.8
10	1939	5.2	3.5	0.6	2.0	1.4	2.1	1.6	0.6	0.4
>10	639	5.0	2.7	1.1	0.9	1.1	2.7	2.0	0.7	0.3
Income ²										
940 € or less	1476	6.1	4.7	1.0	2.4	1.8	2.1	1.7	0.4	0.6
941–1584 €	1323	5.9	3.6	1.0	2.0	1.1	2.6	1.7	1.0	1.0
1585 € or more	1268	7.1	4.8	1.0	2.0	2.8	3.2	1.9	1.2	1.1
Outpatient care ³										
Neurologist or psychiatrist	449	25.6	15.2	5.9	7.0	5.4	13.5	10.7	2.8	2.2
GP, not neurologist or psychiatrist	2811	4.8	3.5	0.6	1.6	1.6	1.5	0.8	0.7	1.0
Other, not neurologist or psychiatrist	562	3.8	2.8	0.0	2.1	1.0	1.4	0.7	0.6	0.3
No	472	0.5	0.5	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Mental disorders, number ⁴										
0	1627	1.9	1.4	0.2	0.6	0.8	0.8	0.4	0.3	0.9
1–2	1579	5.5	3.5	0.9	1.5	1.5	2.2	1.2	1.1	1.2
3 or more	1088	14.2	9.8	2.4	5.2	3.9	5.9	4.5	1.4	0.8

Note: Numbers include post-stratification weights by age and sex of the general population of the study region.

¹ ATC codes.

² Current household-income divided by number of persons per household.

³ Last 12 months prior to the interview.

⁴ Number of positive CID-S items lifetime (Wittchen et al., 1999).

between school education or income and PM use. This also contradicts the finding that utilization of medical care for mental disorders is associated with education (Kessler et al., 2005). In a US national sample, subjects with education of less than 13 years tended to be less likely to exhibit mental health service use but more likely to report utilization of general medical service for any 12-month mental disorder compared to individuals who had 16 years or more education (Kessler et al., 2005). Our data confirm that income is unrelated to utilization of psychiatric and of general medical care facilities for mental disorders (Kessler et al., 2005).

The finding that only 42.3% of the PM users had outpatient contact to a neurologist or psychiatrist during the past 12 months prior to the interview corresponds with the low proportions of utilizing mental health facilities among individuals with any mental disorder among the general population (Alonso et al., 2004b; Bijl et al., 2003; Kessler et al., 2005). Also, among individuals who had contact to a neurologist or psychiatrist just 25.6% took PM. This seems to be low compared to the finding that among general population individuals with any 12-month mental disorder who had used formal health services for emotional problems 60.5% received psychotropic drug treatment (Alonso et al., 2004b).

A clear association between PM intake and screening of mental disorders is revealed by the data. However, the proportion of individuals with PM intake of 6.3% is considerably lower than the proportions of individuals with any mental disorder which have been found among the general population of different countries. In a national sample ($N = 4181$) from Germany 31.1% (women 37.0%, men 25.3%) had a mental disorder during the past 12 months prior to the interview, 19.8% (women 23.9%, men 15.8%) were found to have a diagnosis for the past four weeks prior to the interview (Jacobi et al., 2004). A review of 27 reports including samples of the general population aged 18 to 65 revealed that 27.4% had at least one mental disorder during the past 12 months prior to the interview (Wittchen & Jacobi, 2005). Data from the American general population aged 18 or older revealed that 26.4% met the DSM-IV criteria for one or more mental disorders (anxiety, mood, impulse control, or substance use disorders) during the past 12 months prior to the interview (Demyttenaere et al., 2004).

Among the individuals with PM intake, 11.1% did not have a screening diagnosis of a mental disorder.

This corresponds to the finding that 10.1% of individuals without a 12-month diagnosis of any mental disorder reported psychotropic drug use during the last 12 months prior to the interview in a general population study (Alonso et al., 2004a). One reason for these results might be that PM could have been used because of substance dependence.

A strength of our study is that special effort has been put into the minimization of reporting bias by asking the participants to present all medicament use irrespective of its purpose. Hence, our data seem to be largely valid for PM intake over the past seven days in the general population of a region in Germany. Nevertheless, recall bias among PM users may have influenced our findings. Among the sample were elderly subjects who might have provided incomplete or biased recall, giving data that inherit the risk of misclassification. Several further limitations of our study must be considered: (1) We do not know from the data whether neurologists or psychiatrists or other physicians have prescribed the medicines. According to the reports of the study participants with PM use, 57.7% of them seemed to not having received a prescription from a neurologist or psychiatrist during the last 12 months prior to the interview. (2) The data do not allow any conclusions about the appropriateness of prescriptions or about medicament compliance. In addition to the prescribed medicines that have been taken by the participants and that have been assessed accordingly there may have been prescriptions of medicaments that have not been taken and hence have not been assessed. We did not ask for medicaments that have been prescribed by a physician but not used by the participants. (3) Our data are from one region in East Germany only. At the time of our data collection there have been less expenditures for medicaments per resident in East Germany compared to West Germany (Robert Koch Institut, 2006). However, prescribed medicaments were taken by more residents in East than in West Germany whereas self-medication was more frequent in West Germany compared to East Germany. According to the use of any medicament during the past seven days, only small and negligible differences were found (Knopf and Melchert, 2003). (4) Changes in medicament use over time should be kept in mind. We collected the data for our study in 1997 to 2001. Prescriptions of antidepressants increased from 322 million daily dosages in 1997 to 718 million daily dosages in 2005 whereas the prescription of tranquilizers decreased from 217 million

Table 2. Psycholeptic or psychoanaleptic medicine use during the last seven days (in percent)

	N estimated	Psycholeptics or psychoanaleptics	Psycholeptics (N05) ¹			
			N05 Total	N05A Antipsychotics	N05B Anxiolytics	N05C Hypnotics, Sedatives
N	4294	272	185	43	89	78
Outpatient care ²						
Neurologist or psychiatrist	449	42.3	36.9	61.2	35.5	30.9
GP, not neurologist or psychiatrist	2811	49.2	53.4	38.8	51.1	59.3
Other, not neurologist or psychiatrist, not GP	562	7.8	8.5	0.0	13.4	6.9
No	472	0.8	1.2	0.0	0.0	2.8
Inpatient care						
No	3640	77.2	83.8	79.5	83.4	84.5
Yes 1–9 days	288	7.2	6.7	10.6	6.4	4.9
Yes 10+ days	364	15.6	9.5	9.9	10.2	10.6
Mental disorders, number ³						
0	1627	11.1	12.1	6.3	10.4	15.8
1–2	1579	32.0	30.1	32.7	26.4	30.4
3 or more	1088	56.9	57.7	61.0	63.2	53.8
1–12	2666	88.8	87.9	93.7	89.6	84.2
Somatoform disorders ⁴						
No	3618	64.5	64.5	71.4	58.0	70.8
Yes	676	35.5	35.5	28.6	42.0	29.2
Anxiety disorders ⁴						
0	2319	29.4	29.6	13.3	24.8	37.9
1–5	1975	70.6	70.4	86.7	75.2	62.1
Affective disorders ⁴						
0	2903	40.3	41.8	37.0	38.7	47.8
1–3	1391	59.7	58.2	63.0	61.3	52.2
Alcohol use disorder ⁴						
No	4088	95.0	95.1	94.9	94.0	95.0
Yes	206	5.0	4.9	5.1	6.0	5.0
Medicament use disorder ³						
No	3850	72.5	66.8	73.4	68.5	63.2
Yes	444	27.5	33.2	26.6	31.5	36.8
Illegal drug use ⁴						
No	4175	97.4	96.2	100.0	97.1	94.4
Yes	119	2.6	3.8	0.0	2.9	5.6

Note: Numbers include post-stratification weights by age and sex of the general population of the study region.

¹ ATC codes.

² Last 12 months prior to the interview.

³ Number of positive CID-S items lifetime (Wittchen et al., 1999).

⁴ According to CID-S (Wittchen et al., 1999).

Psychoanaleptics (N06) ¹			
N06A or N06B	N06A Antidepressants	N06B Psychostimulants	N06D Antidementia
112	76	37	41
54.3	63.4	34.2	24.6
38.8	31.1	55.9	71.4
6.9	5.4	9.9	4.0
0.0	0.0	0.0	0.0
65.6	62.6	69.7	76.7
8.8	11.7	2.6	8.3
25.6	25.7	27.7	15.1
11.4	9.5	15.0	35.1
31.5	25.9	45.0	44.6
57.1	64.6	40.0	20.3
88.6	90.5	85.0	64.9
64.6	60.7	73.6	75.4
35.4	39.3	26.4	24.6
29.2	22.2	42.4	55.0
70.8	77.8	57.6	45.0
36.4	31.1	46.2	72.3
63.6	68.9	53.8	27.7
95.8	95.4	96.7	97.0
4.2	4.6	3.3	3.0
83.2	85.6	78.6	90.9
16.8	14.4	21.4	9.1
100.0	100.0	100.0	100.0
0.0	0.0	0.0	0.0

Table 3. Psycholeptic or psychoanaleptic medicine use during the last seven days (odds ratios)

	N	Psycholeptics or psychoanaleptics	Psycholeptics (N05) ¹			
			N05 Total	N05A Antipsychotics	N05B Anxiolytics	N05C Hypnotics, Sedatives
N	4290	304	206	48	98	88
Men	2117	ref	ref	ref	ref	ref
Women ²	2173	2.3 (1.8–2.9)	2.2 (1.6–3.0)	1.3 (0.7–2.4)	2.2 (1.4–3.4)	2.4 (1.5–3.8)
Age ³						
20–39	1360	ref	ref	ref	ref	ref
40–59	1544	1.7 (1.2–2.4)	1.7 (1.1–2.7)	2.3 (0.9–5.9)	1.7 (0.9–2.9)	1.3 (0.7–2.7)
60–81	1386	3.9 (2.8–5.4)	3.4 (2.3–5.1)	4.1 (1.7–10.1)	2.5 (1.5–4.4)	4.3 (2.3–7.9)
School education (years)						
<10	1709	ref	ref	ref	ref	ref
10	1941	0.9 (0.7–1.3)	0.9 (0.6–1.3)	0.6 (0.3–1.4)	1.0 (0.6–1.6)	1.1 (0.6–1.9)
>10	625	0.9 (0.6–1.4)	0.6 (0.4–1.1)	1.0 (0.4–2.5)	0.4 (0.2–1.1)	0.8 (0.4–1.8)
Income ⁴						
940 € or less	1462	ref	ref	ref	ref	ref
941–1584 €	1326	0.7 (0.5–0.999)	0.6 (0.4–0.9)	0.8 (0.4–1.6)	0.7 (0.4–1.2)	0.4 (0.2–0.8)
1585 € or more	1270	0.8 (0.6–1.1)	0.8 (0.5–1.1)	0.7 (0.3–1.5)	0.8 (0.5–1.3)	0.9 (0.5–1.5)
Outpatient care ⁵						
Neurologist or psychiatrist	472	ref	ref	ref	ref	ref
GP, not neurologist or psychiatrist	2813	0.15 (0.11–0.19)	0.2 (0.15–0.3)	0.1 (0.07–0.2)	0.2 (0.1–0.3)	0.3 (0.2–0.5)
Other, not neurologist, psychiatrist, not GP	563	0.11 (0.07–0.18)	0.2 (0.1–0.3)	0.0 (0.0)	0.3 (0.1–0.5)	0.2 (0.1–0.5)
No	442	0.02 (0.004–0.07)	0.03 (0.08–0.1)	0.0 (0.0)	0.0 (0.0)	0.1 (0.03–0.5)
Mental disorders number ⁶						
0	1576	ref	ref	ref	ref	ref
1–2	1586	2.9 (1.9–4.3)	2.5 (1.6–4.0)	5.5 (1.6–18.9)	2.4 (1.2–5.1)	1.8 (0.95–3.4)
3 or more	1128	8.1 (5.5–11.9)	6.9 (4.4–10.8)	14.5 (4.4–48.1)	8.7 (4.4–17.1)	4.0 (2.2–7.3)

Note: Logistic regression analysis, adjusted for age and sex.

¹ ATC codes.

² Adjusted for age groups (20–39, 40–59, 60–81).

³ Adjusted for sex.

⁴ Current household-income divided by number of persons per household.

⁵ Last 12 months prior to the interview.

⁶ Number of positive CID-S items (Wittchen et al., 1999).

Psychoanaleptics (N06) ¹			
N06A or N06B	N06A Antidepressants	N06B Psychostimulants	N06D Antidementia
124	85	40	43
ref	ref	ref	ref
2.0 (1.4–2.9)	2.5 (1.5–4.0)	1.2 (0.7–2.3)	1.6 (0.9–2.9)
ref	ref	ref	ref
2.3 (1.2–4.2)	2.0 (1.1–3.9)	5.2 (0.6–43.1)	3.5 (0.4–31.0)
5.4 (3.0–9.6)	3.2 (1.7–6.1)	31.6 (4.3–231.4)	37.2 (5.1–271.6)
ref	ref	ref	ref
1.1 (0.7–1.8)	1.1 (0.6–1.9)	1.3 (0.6–2.9)	0.7 (0.3–1.7)
1.5 (0.9–2.7)	1.7 (0.9–3.2)	1.2 (0.4–3.4)	0.4 (1.0–1.9)
ref	ref	ref	ref
0.9 (0.5–1.5)	0.7 (0.4–1.2)	1.7 (0.6–4.4)	1.2 (0.5–2.8)
1.0 (0.6–1.6)	0.8 (0.5–1.4)	1.5 (0.6–3.9)	1.0 (0.4–2.5)
ref	ref	ref	ref
0.1 (0.08–0.2)	0.08 (0.05–0.13)	0.3 (0.2–0.6)	0.6 (0.3–1.3)
0.1 (0.04–0.2)	0.06 (0.02–0.17)	0.2 (0.1–0.8)	0.2 (0.05–1.0)
0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)
ref	ref	ref	ref
2.7 (1.5–5.0)	3.4 (1.4–8.4)	2.3 (1.0–5.4)	1.2 (0.6–2.4)
7.5 (4.2–13.4)	13.2 (5.6–30.8)	2.6 (1.1–6.4)	0.9 (0.4–2.1)

daily dosages in 1997 to 152 million daily dosages in 2005 in Germany (Lohse et al., 2007). Changes in the use of psycholeptics and psychoanaleptics underly the same forces in general population medicament use such as marketing factors and actions of the state authorities and may largely not be predicted (Schwabe, 2007). (5) The CID-S does not cover all mental disorders. Furthermore, it was limited to lifetime occurrence of mental disorders whereas the time frame was the last seven days prior to the interview for PM use. (6) We have no data about non-pharmacological psychiatric treatment.

To conclude, first, there are considerable proportions of individuals with current PM use although lower than one would have expected on grounds of the number of subjects with mental disorders in the general population or even those who are treated because of a mental disorder. Second, the results support that more women than men use PM. Third, the data suggest that proportions of PM users clearly are higher at age 40 to 79 than at age 20 to 39.

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Declaration of Interests

All authors declare that they have no conflicts of interest.

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