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Use, Abuse and Dependence of Prescription Drugs in Adolescents and Young Adults

Key Words

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Abstract

Lifetime prevalence estimates of psychotropic medicine use as well as prevalence of DSM-IV prescription drug use disorders from the baseline investigation of the Early Developmental Stages of Psychopathology (EDSP) Study are presented. Use of prescription medication at some time in their life was reported by 27.4% of the respondents. Illicit use of prescription drugs, which means an intake without medical legitimation, was reported by 4.5% of the sample. The findings suggest that abuse of and dependence on prescription drugs, with most cases reporting polysubstance use, is quite rare in the 14- to 24-year-olds. DSM-IV abuse was more prevalent than dependence (0.5 vs. 0.3%). In general, women reported higher prevalence rates of prescription drug use, whereas men reported higher prevalence rates of prescription drug disorders. This result suggests that men have a higher risk to develop a substance-use-related disorder.

Introduction

Knowledge about the use of prescription drugs among adolescents and young adults is sparse, with considerable variation among the few studies available. Moreover, no recent study is available evaluating the abuse and dependence of prescription drugs according to international diagnostic criteria such as ICD-10 [1] and DSM-IV [2]. These criteria define substance dependence as a cluster of physiological, cognitive and behavioral symptoms indicating that the subject continues to use a substance despite knowing about substance-related problems. Substance abuse is defined as a maladaptive pattern of sub-

stance use manifested by recurrent and adverse consequences (e.g. legal problems, recurrent social and interpersonal problems) related to repeated use of the substance.

Our current knowledge about the use of psychotropic medicines in Germany comes mainly from four sources: (a) the Munich and Lübeck Blood Pressure Study [3]; (b) the Upper Bavarian Field Study [4, 5]; (c) the representative surveys (questionnaire and telephone) of drug use commissioned by the Federal Ministry of Health in 1994 and 1995 [6, 7] and (d) a representative questionnaire survey by the Federal Ministry of Health in 1990 [8]. The studies differ considerably in terms of sampling and assessment instruments, the time frame used (current, lifetime), the classifications of psychoactive substances, as well as the analysis used, making it difficult to compare the results directly.

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In the Munich Blood Pressure Study (MBS, 1981) and the Lübeck Blood Pressure Study (LBS, 1984) [3], 9.3% of a representative sample of 20- to 69-year-old residents of Munich (Lübeck: 7.0%) reported having taken some type of psychotropic medication (including hypnotics) during the preceding 7 days. However, it is not clear whether these substances had been prescribed by a doctor or whether they were used appropriately as prescribed. Similar findings were reported from the first wave (1975–1979) of the Upper Bavarian Study (1,536 persons aged 15 years and older), in which 8.1% of the respondents reported the use of psychotropic medications (e.g. tranquilizers, antidepressants, neuroleptics, stimulants, and other drugs acting on the CNS) during the week prior to the interview [5]; no differentiation between licit and illicit use was made. The 1-week prevalence use rate was about three times higher in women (11.4%) compared to men (4.1%). For the youngest age group (15–24 years), a 1-week prevalence of use of 0.8% was estimated. In the second wave of this study (conducted between 1980 and 1983), the rates were considerably higher with reported use of psychotropic medications (not including hypnotics and sedatives) by 18.1% of the sample in the 4 weeks preceding the assessment. Additionally, 16.9% used analgesic drugs and 4.8% hypnotics or sedatives during this period [9]. Again, women consistently showed higher rates of use for most psychotropic drugs.

Whereas the above studies were based on clinical and personal assessments, the survey conducted by the Federal Ministry of Health [6] in 1994 was based on a telephone survey among a representative sample of 18- to 59-year-old residents. More than 10% (12.2%) of this sample reported taking psychotropic medicines (pain relievers, sleeping pills, sedatives, stimulants, appetite suppressants) with a frequency of at least once a week in the previous month. Women reported higher prevalences of psychotropic medicine use than men (15.2 vs. 9.4%). Consumption of these drugs increased with age: the lowest rates were found for the 18- to 20-year-olds (7.8%) and 25- to 29-year-olds (7.3%), whereas the highest rates were found at age 40 years and older (>14%). In the questionnaire survey [7] 1 year later, slightly higher rates of 16% (women 19.3%, men 12.8%) were reported by the respondents (age group 18–20 years: 9.9%; above 40 years: >16%).

Concerning adolescents and young adults, the results of the representative questionnaire survey of 1990 [8] should be mentioned. Based on 18,854 subjects aged 12–39 years in West Germany and 2,420 age-matched subjects in East Germany, this study found that 0.3–2.4% of

the 12- to 24-year-olds took analgesics, sleeping pills, tranquilizers or other psychotropic substances without prescription at least once a week. In particular, rates of sedatives and analgesics/opioids use were higher in women.

In addition to the cited surveys, some data about drug use in specific German Länder are available [10, 11]. The results of Nordlohne et al. [11], comparing 1-year prevalence rates for medication use in 14- to 16-year-old adolescents of Saxony (n = 1,972) and Northrhine-Westfalia (n = 1,695) show that in this age group 1.7% of the respondents (East: 0.8%) used sedating and 1.0% (East: 1.4) stimulating drugs at least once a week in the year preceding the survey.

There are only two German epidemiological studies available that provide at least some limited data on the prevalence of prescription drug-related substance abuse and dependence in adults as assessed by clinical psychiatrists. Based on DSM-III criteria, Fichter [9] estimated a 5-year prevalence of 0.07% for barbiturate abuse, 0.33% for other hypnotic-related abuse diagnoses with 0.07% of the sample fulfilling DSM-III criteria for opioid-related substance abuse during the preceding 5 years among residents of the Upper Bavarian area of Traunstein. In the Munich Follow-up Study (MFS) [12], a national representative survey of 25- to 65-year-olds, 1.79% of the respondents (exclusively women) met criteria for medication-related substance use disorders (abuse or dependence) according to DIS/DSM-III criteria.

In summary, there are only few epidemiological data about the use of prescription drugs among adolescents and young adults in Germany and even fewer about abuse and dependence with almost no data about the frequency of medication-related substance use disorders.

This article reports prevalence data on the use of prescription drugs, their illicit (unprescribed) use as well as clinically manifest diagnoses of abuse and dependence according to DSM-IV among German adolescents and young adults. The term psychotropic prescription drugs includes substances that are usually available as medicines by prescription, e.g. stimulants, sedatives and prescription analgesics or opioids. Illicit use of psychoactive medication means a prolonged self-administration of substances that are taken for no legitimate medical purpose or, if a medical condition is present, that are used in amounts greater than that required for treatment. Following the DSM-IV definition of opioid-related substance use disorders, we will evaluate prescription drug-related abuse and dependence only for subjects with illicit use of prescription drugs.

The following specific questions will be addressed:

(1) How frequently do 14- to 24-year-olds report the use of any psychotropic drug?

(2) How frequently are these drugs used without prescription, either to feel better, to relax or to otherwise modify mood?

(3) How prevalent is DSM-IV abuse of and dependence on psychotropic drugs among 14- to 24-year-old German adolescents and young adults?

Further age- and gender-specific differences as well as the most frequent criteria for abuse and dependence will be explored.

Methods

A complete and detailed description of design, sample, instruments, procedures and statistical methods are given in Wittchen et al. [this issue].

Assessment of Use of Prescription Drugs

In the assessment of prescription drugs [for a detailed overview of the substance use sections of the M-CIDI see Wittchen et al., this issue], we first presented a list of the most often prescribed market names for (a) amphetamines/stimulants; (b) sedatives, hypnotics and anxiolytics, and (c) prescription analgesics and opioids. Table 1 shows the visually presented response list with examples for each type of substance. The names of this list were taken from local statistics to represent the most frequently marketed medications. However, the respondent was free to add any other substance that was then properly grouped later in the editing process after the interview.

The subjects were asked if they had *ever been prescribed* any of the listed drugs. If yes, they were asked first, to mark those drugs in the list that they had taken *every day for at least 2 weeks* and second, to name all prescription drugs they *had used in larger amounts or for a longer period than was prescribed*. With these questions we intended to assess if a subject deviated from prescription regimen. In a second step, we asked the subject if he or she had ever used any of the listed substances on its own, without prescription, either to relax, feel better, feel high or feel more active or alert. If yes, the substance was marked and the subject was asked about the frequency of use. Here our intention was to assess the use of psychotropic drugs without prescription. 'Regular users' were defined as subjects with use of prescription drugs in greater amounts than prescribed or without prescription on at least five occasions. We subsequently evaluated (a) stimulants, (b) sedatives, and (c) opioids/analgesics for quantity and frequency as well as the DSM-IV criteria for substance abuse and substance dependence by type of substance for the regular users.

Results

Prevalence of Prescription Drug Use

The upper portion of table 2 reports the lifetime estimates for prescription drug use for 14- to 24-year-olds by gender and age groups. More than a quarter (27.4%) of all

Table 1. Prescription drugs covered by the M-CIDI

Drug classes	Examples
Amphetamines/ stimulants	AN1, Captagon, Katovit N, Reactivan, Ritalin, Tradon, Fugoa, Ponderax, Recatol, Rosmon
Sedatives/ hypnotics/ anxiolytics	Adumbran, Calmonal, Dalmadorm, Diazepam, Halzion, Lexotanil, Librium, Medinox, Mogadan, Noctamid, Normoc, Planum, Rohypnol, Tafil, Tranxilium, Valium, Vesparax
Opioids/ analgesics	Codeine, Codicaps, Codipront, Paracodin, Tussoretard, Dolomo, L-Polamidon, Valoron, MST, Nedolon, Remedacen, Temgesic, Develin, Tramal, Dolviran

respondents reported having used a prescription drug either with or without prescription at least once. The vast majority (23.5%) indicated having taken these drugs only by prescription. The rate for those reporting having taken psychoactive medications with and without prescription was 2.4%, whereas prevalence of using prescription drugs without any prescription was 1.5%.

Women were more likely than men to use prescription drugs (31.2 vs. 23.5%; OR: 1.5; 95% CI: 1.25–1.73). They were also more likely to get a psychotropic substance prescribed (29.3 vs. 22.4%; OR: 1.4; 95% CI: 1.22–1.69; $p < 0.001$) and to take psychotropic substances without prescription more often than men, either to feel better or to relax (4.6 vs. 3.2%; OR: 1.5; 95% CI: 0.99–2.12; $p < 0.05$).

Prevalence of use increases tremendously with age. For the older age group (18–24 years) the rates are at least twice as high as in the younger age group (any use: OR: 3.1; 95% CI: 2.52–3.82; only prescribed: OR: 2.6; 95% CI: 2.08–3.19; only unprescribed: OR: 5.0; 95% CI: 1.71–14.58; both: OR: 10.4; 95% CI: 3.26–33.03). Differences between the age groups are especially pronounced in women (any use: OR: 3.6; 95% CI: 2.72–4.85; only prescribed: OR: 3.1; 95% CI: 2.30–4.18; only unprescribed: OR: 4.3; 95% CI: 1.21–15.53; both: OR: 5.9; 95% CI: 1.69–17.89).

The lower portion of table 2 shows that only a few subjects (2.6%) reported continuous use of prescription drugs over a period of 2 weeks or longer. An intake of prescription drugs for a period of at least 2 weeks combined with an intake on at least five occasions without prescription was reported by 0.4% of the respondents with 1.3% reporting that they had taken psychotropic drugs without prescription at least five times.

Table 2. Lifetime exposure to prescription drugs and frequency of intake in 14- to 24-year-olds (% , weighted)

	Total						Male						Female					
	total		14-17 yrs		18-24 yrs		total		14-17 yrs		18-24 yrs		total		14-17 yrs		18-24 yrs	
	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw
<i>Ever use of medications</i>																		
Any use (lifetime)	27.4	826	13.8	127	33.3	699	23.5	350	13.1	61	28.1	289	31.2	476	14.6	66	38.2	410
Only use with prescription	23.5	709	13.1	121	28.1	590	20.3	303	12.9	60	23.6	243	26.7	408	13.3	61	32.4	347
Use without prescription	1.5	45	0.4	4	2.0	41	1.1	16	0.2	1	1.5	15	1.9	29	0.6	3	2.4	26
Prescribed and nonprescribed use	2.4	72	0.3	3	3.3	69	2.1	31	-	-	3.1	31	2.7	41	0.7	3	3.5	38
<i>Frequency</i>																		
Prescribed daily > 2 weeks	2.6	79	1.2	11	3.2	68	2.4	35	1.2	5	2.9	30	2.9	44	1.2	6	3.6	38
Prescribed daily > 2 weeks and nonprescribed 5+	0.4	13	0.1	0	0.6	12	0.6	8	-	-	0.8	8	0.3	4	0.1	0	0.4	4
Only nonprescribed 5+	1.3	39	0.2	2	1.7	37	1.0	15	-	-	1.5	15	1.5	23	0.4	2	2.0	21

Nw = Weighted number of respondents; %w = weighted percentage; total Nw = 3,021; total 14-17: Nw = 921; total 18-24: Nw = 2,100; male Nw = 1,493; male 14-17: Nw = 464; male 18-24: Nw = 1,029; female Nw = 1,528; female 14-17: 457; female 18-24: Nw = 1,072.

Table 3. Illicit use of prescription drugs in 14- to 24-year-olds (% , weighted)

	Total						Male						Female					
	total		14-17 yrs		18-24 yrs		total		14-17 yrs		18-24 yrs		total		14-17 yrs		18-24 yrs	
	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw	%w	Nw
<i>Illicit use of prescription drugs</i>																		
Ever	4.5	134	1.1	11	5.8	124	3.8	56	0.8	4	5.1	52	5.0	78	1.4	7	6.6	72
Use in larger amounts than prescribed	0.6	17	0.4	4	0.6	14	0.6	9	0.6	3	0.6	6	0.5	8	0.2	1	0.7	8
Use without prescription	3.6	108	0.7	7	4.8	101	2.8	42	0.2	1	4.0	41	4.3	66	1.2	6	5.6	60
Both	0.3	9	-	-	0.4	9	0.4	5	-	-	0.5	5	0.2	4	-	-	0.3	4
<i>Regular illicit use of prescription drugs¹</i>																		
Ever	2.4	71	0.7	6	3.1	65	2.2	33	0.6	3	2.9	30	2.5	39	0.7	3	3.3	36
Larger amounts than prescribed	0.7	20	0.4	4	0.8	16	0.6	9	0.6	3	0.6	6	0.7	11	0.2	1	1.0	10
Without prescription	1.5	45	0.3	3	2.0	43	1.2	18	-	-	1.8	18	1.7	27	0.5	3	2.3	24
Both	0.2	6	-	-	0.3	6	0.4	5	-	-	0.5	5	0.1	1	-	-	0.1	1
<i>Regular use: specific substances</i>																		
Stimulants	0.8	24	0.3	3	1.0	22	0.7	10	-	-	1.0	10	0.9	14	0.5	3	1.1	12
Sedatives	0.7	21	0.1	0	1.0	21	0.9	13	-	-	1.3	13	0.5	8	0.1	0	0.7	7
Opioids/analgesics	1.4	42	0.4	3	1.8	38	1.4	21	0.6	3	1.8	18	1.3	20	0.1	0	1.9	20

Nw = Weighted number of respondents; %w = weighted percentage.

¹ Regular use = use in larger amounts than prescribed or at least five times unprescribed.

Respondents aged 18-24 years answered these questions in the affirmative much more frequently than 14- to 17-year-olds. Unlike the findings in the rates of use, however, there are no clear gender differences, the frequency of intake being comparable between men and women.

Illicit Use of Prescription Drugs

In our study illicit use of prescription drugs was defined as use of psychoactive medications without medi-

cal legitimation, that is, the subject took more than was prescribed or used drugs prescribed for someone else. Overall, 4.5% of the sample reported having used prescription drugs without medical legitimation at some time (table 3). Analysis of age differences shows that prevalences of 18- to 24-year-olds are five times higher than those found for the younger age group (5.8 vs. 1.1%; OR: 5.5; 95% CI: 3.07-11.53; p < 0.001). Women revealed higher prevalence rates than men (5.0 vs. 3.8%; OR: 1.4;

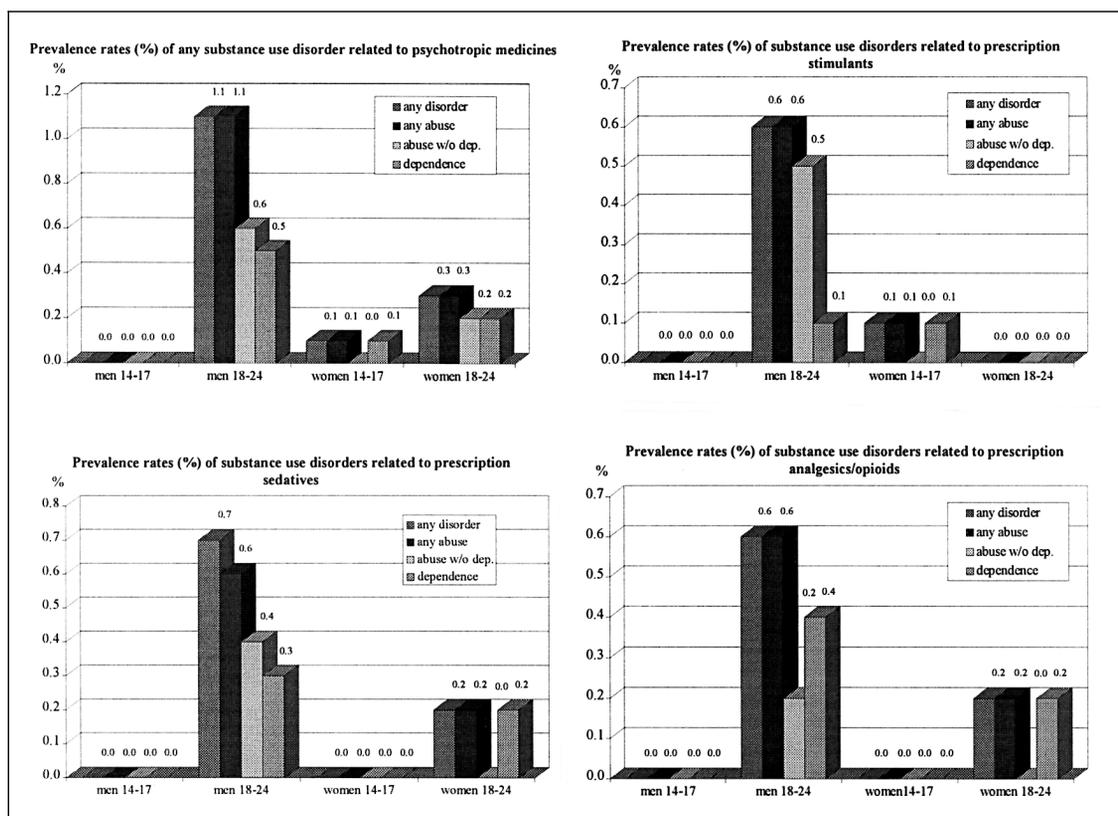


Fig. 1. Lifetime prevalence rates of substance use disorders related to prescription drugs in 14- to 24-year-old German adolescents and young adults.

95% CI: 0.96–1.92; $p < 0.08$), although the results were only marginally significant. The dominant pattern of illicit use of prescription medication is the use of psychoactive drugs that had never been prescribed: 80% (prevalence: 3.9%) of all illicit users had taken medications that had not been prescribed for any medical indication.

The lifetime prevalence of *regular* illicit use was 2.4% with no noticeable gender difference (men: 2.2%, women: 2.5%). Comparable to the other use findings, the prevalence rates of the older age group are much higher than those of the younger age group (regular illicit use: OR: 5.4; 95% CI: 2.24–13.05), especially pronounced for regular use with and without prescription (reported only by subjects older than 17 years). Among regular users, more than half used the drug without prescription. Most frequently mentioned types of substances were analgesics and opioids (1.4%) followed by stimulants (0.8%) and sedatives (0.7%).

In the period of heaviest use, about 50% of all regular users reported having used the substance on at least 3–4 days a week.

Lifetime Prevalence of Substance Use Disorders due to Illicit Use of Prescription Drugs

Figure 1 summarizes the lifetime prevalences of substance use disorders related to prescription drugs by gender, age and type of substance.

The figure reveals four major findings:

- (1) Substance disorders are only prevalent among the 18- to 24-year-olds, only one person in the younger age group met the criteria for psychotropic medication-related substance use disorder (amphetamine dependence);
- (2) although women take medication much more frequently, only very few go on to develop a disorder;
- (3) without regard of one case all subjects with a specific dependence diagnosis met also abuse criteria for the substance, and
- (4) the rates for men are almost three times higher than those for women, especially for abuse.

Prevalence of Specific Diagnostic Criteria

Table 4 shows the distribution of DSM-IV substance use dependence and abuse criteria among regular users as well

Table 4. Distribution of DSM-IV dependence and abuse criteria (%) among regular users with and without diagnoses

DSM-IV criteria	Frequency (%) of criteria					
	amphetamines		sedatives/hypnotics/ anxiolytics		analgesics/opioids	
	all regular users Nw = 24	regular users with diagnosis Nw = 7	all regular users Nw = 21	regular users with diagnosis Nw = 9	all regular users Nw = 42	regular users with diagnosis Nw = 8
<i>Dependence</i>						
Tolerance	21.6	75.3	26.3	59.8	23.0	100.0
Withdrawal	33.4	75.3	41.7	51.0	25.0	77.8
Compulsive use	12.8	44.5	17.0	38.6	9.5	50.3
Unsuccessful desire to stop/cut down/control	9.0	31.5	22.5	51.0	14.6	77.8
Great deal of time using/ recovering from drug	19.7	68.5	36.2	71.2	16.8	77.8
Narrowing of repertoire	21.6	75.3	18.2	41.4	17.2	77.8
Continued use despite physical/psychological problems	19.9	69.2	27.1	61.5	14.6	77.8
<i>Abuse</i>						
Failure in major role obligations	12.8	44.5	17.0	38.6	5.7	30.5
Recurrent use in hazardous situations	23.1	80.3	26.3	59.8	15.1	80.2
Recurrent legal problems	7.1	24.7	–	–	14.6	77.8
Continued use despite persistent social problems	10.8	37.7	31.7	72.0	6.8	35.9

Nw = Weighted number.

as those with a diagnosis for each substance group. Among the regular users without a diagnosis an unexpectedly high number of subjects acknowledged the presence of dependence symptoms. Among stimulant and analgesic/opioid users withdrawal and tolerance were among the most frequently mentioned symptoms, whereas sedative users most often reported, besides withdrawal symptoms, a great deal of time spent to use the drug or recover from its effects. For those with substance use disorder there are remarkable differences between the three substance groups. The highest number of endorsed dependence symptoms is found for those with an analgesic- and opioid-related disorder, followed by those with an amphetamine-related disorder, whereas sedative users with diagnosis report considerably fewer symptoms. Among amphetamine and analgesic/opioid users with diagnosis, tolerance and withdrawal are the most frequently mentioned symptoms. In contrast to these findings, continued use of the drug despite having problems and the use of much time taking the drug or recovering from its effects are the symptoms most often reported by sedative users with diagnosis.

Similarly for abusers, quite different profiles were found for each substance. Regarding the specific abuse criteria, recurrent use in hazardous situations is a dominant abuse symptom in amphetamine and analgesic/

opioid users with and without diagnosis. In contrast to these findings, sedative users most often report continued substance use despite persistent social problems caused by the substance.

Discussion

Using data from our baseline investigation, the objectives of this paper were first to examine the prevalence of licit and illicit use of prescription drugs among adolescents and young adults. Furthermore, the prevalence of DSM-IV substance use disorders related to psychotropic drugs was estimated.

Unlike previous representative surveys that used questionnaires with unknown psychometric properties the presented findings are based on standardized personal diagnostic interviews (M-CIDI) with proven reliability [see Lachner et al. and Wittchen et al., this issue].

Before discussing our findings some critical issues need to be addressed:

(1) The base rates for prescription drug abuse and dependence were too low to provide reasonably stable prevalence estimates, particularly among 14- to 17-year-olds.

(2) Even with the high response rate of 71% [Wittchen et al., this issue], the findings could be influenced by non-response. As results of other surveys (NCS, Kessler et al. [13]; ECA, Eaton et al. [14]) have shown, higher psychopathology is found among nonrespondents. The higher nonresponse rate among 18- to 24-year-old women [Wittchen et al., this issue] could have had an influence on our findings. However, because no data for nonrespondents are available at the moment we are not able to examine the effect on our data in more detail.

(3) The M-CIDI does not allow the detailed determination which of the symptoms might be entirely due to prescription drugs or the illicit drugs. Thus, the presented prevalence of prescription drug abuse and dependence should be interpreted as an upper bound estimates.

(4) The findings exclusively refer to adolescents and young adults in the metropolitan area of Munich. Thus, the prevalence rates cannot be used to estimate the size of the problem for Germany as a whole. It might be possible that prevalence rates from other metropolitan cities are higher, whereas rates from more rural areas might be considerably lower.

Despite these limitations, our study revealed three important findings.

(1) In accordance with almost all studies available [see review Perkonig et al., this issue; 15], we confirm that consumption rates of all types of the examined prescription drugs are higher in women than in men, with 31.2% of all women and 23.5% of all men reported having ever used any prescription drugs. This pattern was quite stable across all age groups and was also found for infrequent and regular use.

The findings for the illicit use of prescription drugs, however, tell a slightly different story. Regular illicit use, defined as 'use of prescription drugs in larger amounts or more frequently than prescribed or without prescription, either to feel better, feel high or to relax, on at least five occasions', was almost equally frequent among men (2.2%) and women (2.5%), with no difference between type of substances. The most frequently regularly used prescription drugs were analgesics and opioids, followed by stimulants (slightly higher in women), and sedatives (slightly higher in men).

(2) Although women have considerably higher consumption rates, male adolescents and adults are almost three times more likely to develop a DSM-IV prescription substance use disorder than women (men: 0.8%; women: 0.3%). To our knowledge, this finding has not been reported previously. A closer case by case examination of all cases revealed that all men with a prescription drug-

related abuse or dependence diagnosis also have at least one additional disorder of another type of substance, most frequently of alcohol, cannabis, stimulants and hallucinogens. By contrast, none of the women with a prescription drug disorder fulfilled criteria for abuse or dependence of any other illicit drug. This suggests: (a) that prescription drug disorders in men, unlike to women, rarely occur in pure forms and are usually associated with poly-substance use and disorders, and (b) that there might exist considerably different sex-specific pathways into abuse or dependence.

(3) The examination of symptom profiles for dependence revealed substance specific differences for regular users as well as respondents with an abuse or dependence diagnosis. The interpretation of this finding that possibly reflects partly the different pharmacological effects of the substances as well as associated consumption habits, however, is not clear, due to the above-mentioned limitations of the assessment strategy which does not allow a proper delineation of symptoms and criteria that are specifically due to prescription drugs and those due to the regular use of other illicit substances. As mentioned above, the low base rates for estimating prevalences do not allow any further exploration.

To conclude, our results indicate that illicit use of 'legal drugs' occurs among adolescents and young adults almost as frequently as the use of illicit drugs (not including cannabis; Perkonig et al. [16], in this issue).

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