

Nonmedical use of prescription drugs: A comparison between intoxication-oriented and other nonmedical users

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Abstract

Aims: Nonmedical use of prescription drugs (NMUPD) is a major public health concern. The aim of the study was to compare intoxication-oriented users to those who utilised prescription drugs nonmedically for other purposes. The characteristics of the study groups, prescription drugs used, motivations for their use and sources of prescription drugs were also examined. **Methods:** Data were derived from the population-based Drug Survey 2014 which was conducted in Finland. The respondents were divided into intoxication-oriented users ($n = 118$) and other nonmedical users ($n = 74$) according to the motivation behind their NMUPD. The reference population ($n = 3277$) did not report any NMUPD. Pearson's chi square test was used to compare the distributions. A multinomial logistic regression model was used to estimate the association of sociodemographic background and intoxicant use with NMUPD. **Results:** Low education level and illegal drug use were associated with intoxication-oriented and other nonmedical use of prescription drugs. Intoxication-oriented use was associated also with younger age and current smoking. Sedatives were the most commonly used prescription drugs among intoxication-oriented users, and opioids among other nonmedical users. Experimentation and facilitating social interactions as a motivation

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for use were emphasised among intoxication-oriented users. Friends and relatives were the most common sources of prescription drugs for nonmedical use, especially among intoxication-oriented users. **Conclusion:** The characteristics, motivations and sources of nonmedically used prescription drugs differed in intoxication-oriented and other nonmedical users. These findings may help to identify those at risk for NMUPD. More attention should be paid to the motivations of NMUPD when new prevention and intervention methods are developed.

Keywords

drug users, nonmedical use of prescription drugs, opioids, population-based survey, sedatives

There are no standardised definitions for the terms “misuse”, “abuse” and “nonmedical or nontherapeutic use” that are utilised to describe inappropriate use of (prescription) drugs; in the literature, many different criteria have been proposed (Barrett et al., 2008; Smith et al., 2013). Typically, prescription drug misuse and both nonmedical and nontherapeutic use are defined as medication use that occurs without a prescription or where the use of drug does not follow medical indications or prescribed dosing (Barrett et al., 2008; Smith et al., 2013). The main characteristic related to “abuse” is that the drug is used to obtain psychotropic effects, for example euphoria or sedation (Smith et al., 2013).

The classes of prescription drugs associated with nonmedical use are analgesics, anxiolytics, sedatives, anaesthetics and stimulants (Hernandez & Nelson, 2010). In the United States (US), the numbers of prescriptions written for opioids have significantly increased in the past decades (Sites et al., 2014). The European Union (EU) has also seen a rise in the number of prescriptions concerning drugs that affect the central nervous system, but the prevalence and user characteristics have been less extensively studied in comparison with the US (Novak et al., 2016). In the US, the past year prevalence for misuse of prescription psychotherapeutic drugs was 7.1% in 2015; subdivided into drug classes, the prevalence was 4.7% for pain relievers, 2.3% for tranquilisers, 2.0% for stimulants and 0.6% for sedatives

(Hughes et al., 2016). In the EU, the lifetime prevalence of nonmedical prescription drug use was 14% for opioids, 11% for sedatives and 7% for stimulants in 2014 (Novak et al., 2016). In Finland, nonmedical use has been recognised for some time; for example, if one considers illegal substances, then only cannabis use is more common than the nonmedical use of prescription drugs (NMUPD) (Karjalainen et al., 2016). In the Finnish population, the lifetime prevalence of nonmedical use of sedatives and analgesics was 7% based on data collected in 2002, 2006 and 2010 (Karjalainen & Hakkarainen, 2013).

NMUPD can be divided into different categories according to the motivation behind the use. Nonmedical use may be recreational which contains the motivations of “getting high”, or to counteract the effects of other drugs and finally experimentation (LeClair et al., 2015; McCabe et al., 2009). On the other hand, a common reason for NMUPD seems to be treating a medical condition in the form of self-treatment (Lipari et al., 2017). The motivation to “get high” is mostly associated with adolescents and young adults, whereas among older adults this motivation is not common (Blow et al., 2006; Compton & Volkow, 2006).

The prescription drugs for nonmedical use are most often sourced for free from friends and family members (Hulme et al., 2018; Schepis et al., 2019). Other common sources are dealers and black markets, legitimate medical sources and buying from friends and family, whereas

doctor shopping and prescription forgery are relatively uncommon. The internet has been a rather uncommon source for nonmedically used drugs (Back et al., 2010; Hulme et al., 2018; Novak et al., 2016). However, due to the rapid increase of anonymous internet usage, it may have become more common in recent years. Less is known about whether the sources differ according to the motivation behind the NMUPD (Compton & Volkow, 2006). The purpose of this study is to reveal additional information about NMUPD especially from the European point of view, as it has been less extensively studied. Furthermore, more information is needed about the different subtypes of NMUPD (McCabe et al., 2009; McCabe & Cranford, 2012).

The aim of this study was to determine the characteristics related to intoxication-oriented and other nonmedical use of prescription drugs. Secondly, the differences between intoxication-oriented users and other nonmedical users were examined, for example with respect to sources of prescription drugs and the motivations for use of prescription drugs for nonmedical purposes.

Material and methods

Data

This study is based on the population-based Drug Survey 2014. The data were collected in Finland by Statistics Finland for the Finnish Institution for Health and Welfare. A representative systematic random sample was drawn from the Finnish population register, and the data were collected via self-administered anonymous questionnaires. Responding to the survey was possible either by post or via the internet. The target population were those aged 15–69 years who were permanently living in Finland. The age group 15–39 years was over-sampled to gain sufficient data from the population group most involved with drugs. The institutionalised population and those who did not have a permanent address in mainland

Finland were excluded. The size of the random sample was 7,000 and the number of respondents was 3,485. Therefore, the response rate was approximately 50%.

Measurements

In this study, NMUPD was defined similarly as in the survey questionnaire where NMUPD was referred to as the nonmedical use of prescription drugs such as sedatives, anxiolytics or strong painkillers. Nonmedical use indicates the use of drugs without prescription, at higher doses than recommended, or for different purposes than prescribed. In this study, the respondents were divided into three groups. The first group included intoxication-oriented users of prescription drugs ($n = 118$) (later referred to as intoxication-oriented users). The second group included other nonmedical users of prescription drugs ($n = 74$) (later referred to as other nonmedical users). The respondents in these groups had answered “yes” to the question “Have you sometimes tried or used medicines for nonmedical purposes?” Those who had not answered the above question ($n = 16$) were excluded from the study. The questions concerning prescription drug types were asked as follows: “Have you sometimes used sedatives or sleeping pills for nonmedical purposes?” “Have you sometimes used strong pain killers for nonmedical purposes?” “Have you sometimes used pregabalin for nonmedical purposes?” In addition, 1–5 examples of common trade names were given after each question. The intoxication-oriented users had used prescription drugs, such as sedatives, anxiolytics, strong analgesics or pregabalin, with the aim of becoming intoxicated or to intensify the effect of other substances. The other nonmedical users were those who had not used prescription drugs for purposes mentioned above but had chosen other causes for their nonmedical use, such as treating pain or insomnia. Those who did not report NMUPD were considered as a reference population ($n = 3,277$). Any use during the lifetime was defined as NMUPD in

this study. To identify differences between user groups and the reference population, the following indicators were measured: gender, age group (15–24, 25–34, 35–69), education (basic, secondary, higher), housing (lives alone, lives with other people), current smoking (yes, no), illegal drug use during the last 12 months (yes, no) and binge drinking (women ≥ 4 alcohol units, men ≥ 6 alcohol units more than once a month; yes, no). Intoxication-oriented and other nonmedical users were compared in greater detail according to the prescription drugs used (sedatives, opioids, pregabalin), motivations for use and sources of prescription drugs for non-medical purposes.

Statistical analysis

Cross-tabulation was used to describe the distributions of different variables among intoxication-oriented users, other nonmedical users and the reference population. *P*-values were calculated by using Pearson's chi-squared test in order to estimate whether the observed differences were statistically significant. A multinomial logistic regression model was used to estimate the association of sociodemographic background and intoxicant use with NMUPD. The first model was unadjusted, whereas the second model was adjusted for gender, age, education and housing and the third model took into account gender, age, education, housing, smoking, illicit drug use and binge drinking. Weighting coefficients were used to restore the population representation and they were based on age, gender, education and geographic division. The weighting coefficients were calculated by Statistics Finland. *P*-values < 0.05 were considered to be statistically significant. SPSS Statistics software version 25 was used to analyse the data.

Research ethics

In data collection, the study protocol was approved by the Ethical Review Board of the Finnish Institute for Health and Welfare (approval number THL/622/6.02.01/2014).

Results

Characteristics of intoxication-oriented and other nonmedical users of prescription drugs

There were more men than women in the intoxication-oriented and other nonmedical user groups (Table 1). Intoxication-oriented users were more often younger than 35 years than the other nonmedical users and the reference population. Of the other nonmedical users, approximately half were older than 35 years; in the reference population, those older than 35 years were the largest group.

Lower education level was more common in intoxication-oriented users as compared to both other nonmedical users and the reference population. It was also more common in other nonmedical users in comparison to the reference population. Higher education was, in turn, more common in both the other nonmedical users and the reference population as compared to intoxication-oriented users. Living alone was more common in both intoxication-oriented users and other nonmedical users than in the reference population. One third of intoxication-oriented users and 40.3% of other nonmedical users were living alone whereas the corresponding proportion in the reference population was 20.4%. Intoxication-oriented users and other nonmedical users were more often living in the metropolitan area or in large cities (more than 100,000 citizens) compared to the reference population (data not shown).

The use of illegal drugs, smoking and binge drinking were more common among intoxication-oriented users when compared to the other nonmedical users. In addition, these characteristics were more common in other nonmedical users than in the reference population.

Factors associated with NMUPD

Gender was not associated with NMUPD, neither with intoxication-oriented use nor with other nonmedical use, when adjusted for age,

Table 1. Absolute numbers and weighted percentages (with 95% confidence interval, CI) of characteristics of intoxication-oriented prescription drug users, other nonmedical prescription drug users and the reference population ($n = 3,469$).

	Intoxication-oriented users		Other nonmedical users		Reference population		p-value
	$n = 118$ % (n)	95% CI	$n = 74$ % (n)	95% CI	$n = 3277$ % (n)	95% CI	
Gender							0.022
Male	57.5 (61)	45.5–69.5	62.7 (42)	48.9–76.5	49.6 (1429)	47.2–52.0	
Female	42.5 (57)	28.5–56.5	37.3 (32)	19.4–55.2	50.4 (1848)	48.0–52.8	
Age							< 0.001
15–24	32.7 (43)	17.6–47.8	8.7 (17)	–1.7–39.1	16.3 (628)	13.2–19.4	
25–34	38.1 (46)	23.6–52.6	33.3 (28)	14.8–51.8	16.7 (678)	13.6–19.8	
≥ 35	29.2 (29)	13.7–44.7	48.0 (29)	31.7–64.3	67.0 (1971)	65.0–69.0	
Education							0.004
Basic	30.4 (33)	14.9–45.9	26.0 (16)	6.3–45.7	19.0 (524)	15.9–22.1	
Secondary	50.9 (59)	37.9–63.9	45.2 (32)	28.2–62.2	49.1 (1476)	46.6–51.6	
Higher	18.8 (26)	2.1–35.5	28.8 (25)	9.4–48.2	31.9 (1194)	29.0–34.8	
Housing							< 0.001
Lives alone	29.2 (36)	13.7–44.7	40.3 (29)	22.4–58.2	20.4 (647)	17.3–23.5	
Lives with other people	70.8 (82)	60.8–80.8	59.7 (44)	45.0–74.4	79.6 (2537)	78.0–81.2	
Illegal drug use during the last 12 months							< 0.001
Yes	52.2 (62)	39.5–64.9	27.0 (21)	7.5–46.5	4.4 (154)	1.0–7.8	
No	47.8 (56)	34.5–61.1	73.0 (53)	61.2–84.8	95.6 (3119)	94.9–96.3	
Smoking							< 0.001
Yes	58.4 (70)	46.5–70.3	41.9 (33)	24.2–59.0	23.0 (730)	20.0–26.0	
No	41.6 (48)	27.5–55.7	58.1 (41)	43.4–72.8	77.0 (2544)	75.4–78.6	
Binge drinking at least once a month							< 0.001
Yes	46.0 (55)	32.5–59.5	40.5 (31)	22.9–58.1	29.7 (933)	26.8–32.6	
No	54.0 (63)	41.5–66.5	59.5 (43)	45.0–74.0	70.3 (2342)	68.4–72.2	

Note. The number of missing values: Education $n = 84$, Housing $n = 95$, Illegal drug use $n = 4$, Smoking $n = 3$, Binge drinking $n = 5$.

education, housing, drug use, smoking and binge drinking (Table 2, Model 3). The intoxication-oriented use of prescription drugs was associated with younger age (15–24 age group; *OR* 1.78, *CI* 1.04–3.07, and 25–34 age group; *OR* 3.60, *CI* 2.13–6.06) whereas nonmedical use was associated with the age group 24–35 years (*OR* 2.30, *CI* 1.30–4.05) when other variables were held constant. Basic education was associated with intoxication-oriented use

as well as other nonmedical use, whereas secondary education was associated only with intoxication-oriented use. Living alone was independently associated with other nonmedical use, but not with intoxication-oriented use (Table 2, Model 3).

The use of illegal drugs was highly associated with NMUPD in both intoxication-oriented and other nonmedical users. This association was not entirely explained by gender, age, education,

Table 2. A multinomial logistic regression modelling of factors associated with intoxication-oriented and other nonmedical use of prescription drugs.

	Model 1 ¹		Model 2 ²		Model 3 ³							
	Intoxication-oriented users		Intoxication-oriented users		Intoxication-oriented users							
	OR	95% CI	OR	95% CI	OR	95% CI						
Gender												
Male	1.37	0.94–2.00	1.72	1.07–2.77	1.29	0.87–1.90	1.61	0.99–2.61	0.86	0.56–1.33	1.33	0.81–2.18
Female												
Age												
15–24	4.58	2.84–7.39	1.54	0.82–2.90	3.88	2.37–6.34	1.54	0.80–2.94	1.78	1.04–3.07	1.04	0.53–2.06
25–34	5.18	3.26–8.24	2.74	1.62–4.61	6.21	3.85–10.0	3.02	1.75–5.22	3.60	2.13–6.06	2.30	1.30–4.05
≥ 35												
Education												
Basic	2.73	1.56–4.74	1.49	0.79–2.81	3.42	1.86–6.26	1.98	1.01–3.89	3.92	2.07–7.45	2.09	1.05–4.14
Secondary	1.75	1.06–2.90	1.03	0.59–1.80	2.12	1.25–3.60	1.22	0.69–2.17	2.00	1.14–3.51	1.2	0.67–2.15
Higher												
Housing												
Lives alone	1.59	1.05–2.41	2.66	1.65–4.28	1.79	1.17–2.76	2.68	1.65–4.34	1.29	0.81–2.06	2.26	1.38–3.70
Lives with other people												
Smoking												
Yes	4.73	3.22–6.94	2.46	1.54–3.93					2.10	1.34–3.28	1.54	0.91–2.60
No												
Illegal drugs during the last 12 months												
Yes	23.99	15.98–36.01	7.92	4.60–13.62					14.49	8.88–23.67	5.15	2.74–9.68
No												
Binge drinking at least once a month												
Yes	2.03	1.39–2.97	1.63	1.02–2.61					0.88	0.56–1.38	1.02	0.63–1.71
No												

Note. OR shown in bold type, $p < 0.05$.

¹Unadjusted model. ²Adjusted for gender, age, education and housing. ³Adjusted for gender, age, education, housing, smoking, illegal drugs during the last 12 months and binge drinking.

Table 3. Absolute numbers and weighted percentages (with 95% confidence interval, CI) of prescription drugs, motivation for use and source of prescription drugs in intoxication-oriented users and other nonmedical users ($n = 192$).

	Intoxication-oriented users $n = 118$ % ¹ (n)	95% CI	Other non-medical users $n = 74$ % ¹ (n)	95% CI	p-value
Prescription drugs					
Sedatives	70.6 (77)	60.4–80.8	52.1 (36)	36.2–68.0	0.011
Opioids	56.4 (67)	44.1–68.7	58.7 (38)	42.8–74.6	0.762
Pregabalin	23.1 (26)	6.6–39.6	11.3 (7)	–12.2–34.8	0.057
Motivation for use					
Experiment	64.3 (75)	53.2–75.4	31.8 (21)	11.9–51.7	< 0.001
Treat pain/other ailment	40.9 (47)	26.5–55.3	49.2 (33)	31.9–66.5	0.284
Cope with everyday life	40.9 (48)	26.5–55.3	37.9 (26)	18.9–56.9	0.691
Insomnia	37.8 (44)	23.1–52.5	39.7 (27)	21.2–58.2	0.803
Work/study-related stress	32.4 (34)	13.1–44.5	27.7 (18)	7.0–48.4	0.51
Treat results of substance use	31.5 (18)	16.1–46.9	22.7 (14)	1.5–43.9	0.208
Facilitate social interaction	27.9 (36)	12.1–43.7	13.8 (8)	–8.7–36.3	0.031
Intensify the effect by taking a higher than recommended dose	23.9 (31)	7.5–40.3	26.6 (16)	5.6–47.6	0.691
Source of prescription drugs					
Relatives/friends	73.9 (89)	64.4–83.4	58.2 (42)	42.7–73.7	0.030
Own prescription	45.0 (50)	31.1–58.9	53.7 (35)	37.4–70.0	0.258
Other sources ²	34.9 (37)	19.7–50.1	16.9 (12)	–5.3–39.0	0.011

Note. Missing values: Prescription drugs $n = 15$, Motivation for use $n = 11$, Source of prescription drugs $n = 10$.

¹Does not sum to 100% because multiple choices were allowed. ²False prescription, black market, theft, from abroad, internet.

housing, smoking and binge drinking, since the ORs decreased but remained statistically significant after adjusting for these variables (Table 2, Model 3). Smoking was associated with intoxication-oriented use, but not with other non-medical use. Binge drinking did not exhibit an independent association either with intoxication-oriented or other nonmedical use.

Motivations for NMUPD and sources of prescription drugs

The types of prescription drugs being used, the sources of prescription drugs and the motivations for NMUPD were examined more closely for intoxication-oriented and other nonmedical users (Table 3). Intoxication-oriented users typically used sedatives (70.6%) whereas opioids were the

most widely used drug group among other non-medical users (58.7%). Pregabalin use was twice as common among intoxication-oriented users than among other nonmedical users, even though this result did not reach statistical significance.

The study respondents were divided into study groups based on the motivation for non-medical use (intoxication-oriented use or other nonmedical use). In addition to the motivations to become intoxicated or to intensify the effect of other substances, experimentation was a common motivation for intoxication-oriented users, whereas it was significantly less common motivation for other nonmedical users. Furthermore, facilitating social interaction was a significantly more common motivation for intoxication-oriented users than for other non-medical users. Other common motivations for

intoxication-oriented users were to treat pain and other ailments, to cope with everyday life and insomnia which were the most common motivations for other nonmedical users as well. Overall, forms of self-treatment, such as attempting to treat pain and insomnia, were more common in other nonmedical users even though the differences were not statistically significant.

The most common sources of prescription drugs for nonmedical purposes were friends and relatives. Approximately three quarters of intoxication-oriented users and two thirds of other nonmedical users had received the prescription drugs from these sources. Of other nonmedical users, 53.7% had used their own prescription to obtain drugs for nonmedical purposes whereas the respective proportion was 45.0% among intoxication-oriented users. The use of other sources (false prescription, black market, theft, from abroad, internet) was significantly more common among intoxication-oriented users than among other nonmedical users.

Discussion

Main findings and their interpretation

Among the Finnish general population in 2014, 5.5% had used prescription drugs for nonmedical purposes. The prevalence of intoxication-oriented use was 3.4% and the prevalence of other nonmedical use was 2.1%. There were both resemblances and differences between intoxication-oriented and other nonmedical users. Low education level and illegal drug use were associated with both intoxication-oriented and other nonmedical use of prescription drugs. Intoxication-oriented use was associated also with younger age and current smoking. Sedatives were the most commonly used prescription drugs among intoxication-oriented users whereas it was opioids among the other nonmedical users. The common motivations for both intoxication-oriented and other nonmedical use were to treat pain and other ailments, to cope

with everyday life and to treat insomnia. Among intoxication-oriented users, experimentation and facilitating social interactions as the motivation for NMUPD were emphasised as compared to other nonmedical users. Close relatives and friends were the most common sources of prescription drugs for both groups, particularly for intoxication-oriented users.

Intoxication-oriented and other nonmedical use of prescription drugs were more common in those respondents with a younger age. This is in accordance with previous studies since the misuse of prescription drugs has been found to be most common among young adults (NIDA, 2018). However, NMUPD has also increased among older adults in recent decades (NIDA, 2018; Schepis & McCabe, 2016).

In previous studies, NMUPD has been associated with both female gender (Abrahamsson & Hakansson, 2015) and male gender (Back et al., 2010; Novak et al., 2016; Osborne et al., 2017). This observed variability may result from different motivations for NMUPD, since, according to McCabe et al. (2009), self-treatment is more prevalent among females, whereas recreational use is more common in males. However, in this study, although there were more men than women in both the intoxication-oriented and other nonmedical users, gender was not associated with NMUPD in the adjusted models.

Lower education level seemed to be an indicator for NMUPD; this has been observed in previous studies (Esser et al., 2019; Han et al., 2015; Votaw et al., 2019). According to Esser et al. (2019) and Han et al. (2015), lower education is associated with prescription opioid misuse and a similar link was found by Votaw et al. (2019) for benzodiazepine misuse. However, it should be noted that those involved with NMUPD are often young people, and their younger age may partly explain the lower education levels in nonmedical users of prescription drugs.

Other nonmedical use was associated with living alone, and the motivations listed were to treat pain and other ailments. Social isolation

and loneliness have been found to be associated with poor health (Hämmig, 2019; Miyawaki, 2015). Therefore, it may be that those other nonmedical users who live alone more often may be experiencing health problems and this leads to their nonmedical use of prescription drugs as a form of self-treatment.

Although other substance use was associated in particular with intoxication-oriented use, binge drinking did not have an independent association either with intoxication-oriented or other nonmedical use. The odds of binge drinking and illicit drug use have been found to be greater for recreational prescription drug misuse than for the self-treatment subtype (McCabe et al., 2009). In addition, those with recreational benzodiazepines misuse have been found to combine these drugs with other substances (Votaw et al., 2019). Overall, it seems that intoxication-oriented users (who most likely resemble recreational users) use different substances either one at a time or mixed with other psychoactive compounds with the aim to achieve an intoxicated, recreational state. In Finland, episodic heavy drinking and problematic alcohol use are rather common among men and women in all adult age groups (Moskalewics et al., 2016), which may partly explain why binge drinking was not associated with NMUPD when compared to the reference population.

The misuse of tranquilisers and sedatives is known to be associated with the aims to “relax or relieve tension” and “help with feeling or emotions” (Lipari et al., 2017). Thus, the explanation why sedatives were more commonly used among intoxication-oriented users than other nonmedical users may be traced to these motivations, such as to cope with work-related stress or to facilitate social interaction. Furthermore, it has been reported that the main reason for opioid misuse is to relieve physical pain (Han et al., 2017; Lipari et al., 2017). This was also seen in our study, especially among other nonmedical users, who typically used opioids. It appears that in other nonmedical users, the purpose of nonmedical use may often be self-

treatment (Han et al., 2017; Lipari et al., 2017). Therefore, in these individuals, it may be that illegal drugs are also used as a self-treatment, which can explain the observed association with illegal drug use.

Experimentation as a motivation for NMUPD was emphasised among intoxication-oriented users. This could be partly explained by the intoxication-oriented users’ younger age, since instability and experimentation are typical features for emerging adults (Arnett, 2005). Emerging adults are more likely to underestimate the risk of drug use, and the instability of their lives could lead to anxiety and sadness, which could explain their willingness to experiment with prescription drugs (Arnett, 2005).

The most common sources of prescription drugs for nonmedical purposes were relatives and friends as well as their own prescriptions; this was the case for both intoxication-oriented and other nonmedical users, as also reported elsewhere (Hulme et al., 2018; Novak et al., 2016; Schepis et al., 2019). As expected, intoxication-oriented users used illegal drugs and sources like the black market more often than the other nonmedical users. This is in line with previous studies suggesting that those who use illicit sources such as theft or sourcing via dealers are also more likely to be using illicit drugs (Hulme et al., 2018; Novak et al., 2016).

Limitations

The study design was cross-sectional and thus no causal inference can be drawn. The results may have underestimated the studied associations, since the sampling protocol excluded the institutionalised population and those without a permanent address (e.g., problem drug users) from the sample. The data were based on self-reporting and people may not want to report their nonmedical prescription drug patterns. On the other hand, the survey was confidential and anonymous, which could reduce the response bias. A relative low response rate may give rise to selection bias, because it is conceivable that nonrespondents included a

considerable proportion of nonmedical prescription drug users, especially those using prescription drugs for intoxication purposes. Thus, the overall prevalence of nonmedical prescription drug use may have been affected by low participation in this study. Due to this fact, the generalisability of our results is limited, and the results should be considered with caution. The lifetime NMUPD is a rather rough indicator that does not describe very well more regular non-medical use. Nonetheless, it was used as a measure, since the sample size did not enable the use of more precise measures, such as NMUPD during the last 12 months or the last 30 days.

Conclusion

In conclusion, intoxication-oriented and other nonmedical users differ in their motivations for NMUPD as well as in their sources of non-medically used prescription drugs. Experiment, and social interaction, as a motivation for use, and sources other than own prescription are emphasised in intoxication-oriented users. Understanding the characteristics associated with nonmedical use can help to identify those at risk of NMUPD. Furthermore, more attention should be paid to the motivations that drive NMUPD when new prevention and intervention methods, such as education programmes and psychosocial treatments, are being developed.


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