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Non-Prescription Use of Pain Relievers Among Middle Aged and Elderly Community Adults: National Survey on Drug Use and Health

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Abstract

OBJECTIVES—To estimate the frequency, distribution, and correlates of non-prescription use of pain relievers among middle aged and elderly persons in the United States.

DESIGN—Cross-sectional data analysis of a national community survey.

SETTING—The 2005 and 2006 National Surveys on Drug Use and Health (NSDUH).

PARTICIPANTS—10,953 respondents 50 years of age and older (6,717 respondents 50–64 years of age and 4,236 respondents 65+ years of age).

MEASUREMENTS—Social and demographic variables, detailed assessment of non-prescription use (and abuse) of prescription pain relievers (e.g., acetaminophen with codeine, morphine), substance use, major depression, self-reported medical illnesses, and self-rated health.

RESULTS—Non-prescription use of prescription pain relievers was reported by 1.4% of the sample during the past year. Combinations of acetaminophen with hydrocodone or propoxyphene were the most commonly used drugs. Use was associated with younger age (Odds Ratio, OR = 2.39, 95% CI = 1.31–4.36), American Indian/Alaska native (OR = 8.78, 95% CI = 2.50–30.85) and use of marijuana (OR = 7.07, 95% CI = 3.99–12.53). Less than 10% of non-prescription users were abusing these medications or dependent upon them.

CONCLUSION—In a representative sample of middle aged and older adults, non-prescription use of prescription pain relievers is relatively uncommon. Nevertheless, the much higher use among middle aged adults suggests that as this cohort ages, the problem may increase among the elderly.

Keywords

elderly; pain relievers; non-prescription use; epidemiology; opioids; prescription drug misuse

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INTRODUCTION

Non-medical (non-prescription) use of prescription opioids has increased significantly in the general population over the past few years.^{1 2} Non-medical use of prescription pain relievers is the category of medications most often used without a prescription, higher than for tranquilizers and sedatives combined. Use during the past year among those 12 and older increased from 3.0% to 5.1% as estimated by the National Survey on Drug Use and Health.¹ In community surveys, use is highest among those 18-20 years of age, among males, and those who use substances. Risk factors for use vary by gender, with use by women associated with serious mental illness and cigarette smoking and use among men associated with past-year inhalant use.³ Yet most reports from community studies do not specify the use among persons over the age of 50, much less among those 65+ years of age.

Chronic pain, by far the most common reason for non-prescription use of prescription pain medications, is frequent in late life. In a national survey from Denmark, 22.5% of men and 27.8% of women 65+ years of age reported chronic pain.⁴ Thirty-five percent were not satisfied with the pain treatment offered. The most common causes of pain in the overall survey were musculoskeletal, trauma/injuries, digestive problems, and nervous system problems. In a second survey from Australia, prevalence of chronic pain peaked in the 65-69 age group and was also associated with female gender, lower levels of completed education, and not having private health insurance, and strongly associated with receiving a disability benefit. It should be noted, however, that persistent non malignant pain is still undertreated and dependence with opioids used chronically for this purpose is rare.

Prescriptions for opioids have increased dramatically over the past few years and this increased has paralleled the non-prescription use of these medications.⁵ Non-prescription use of pain medications has been found to be especially frequent among patients with chronic pain.^{6 7} In one study of 100 chronic pain patients (average age near 50), 23 tested positive for illicit drugs and 12 were positive for opioids even though they had no prescription and denied taking opioids.⁶ In a second study of primary care patients in a Veterans Administration facility who were receiving opioids for the treatment of chronic pain (average age 59), 78% reported at least one indicator of medication misuse during the prior year, with significantly more of those who misused pain medications reporting a comorbid substance use disorder.^{7 8} Following alcohol, opiates were the second most commonly reported primary substance of abuse among adults aged 50 or older admitted to substance abuse treatment programs that receive some public funding in the United States.⁹ Opiates were reported most frequently by admissions aged 50 to 54 and 55 to 59 (22 and 19 percent, respectively).⁹

In this study, we present the prevalence and distribution of non-prescription use of pain medications in a national representative sample of 50+ year olds, about 40% of whom are 65+ years of age from the National Survey on Drug Use and Health (NSDUH). We combine two years (2005 and 2006) of data to increase the sample size. Given that substance use, including use of prescription pain medications, among later middle aged and older adults is predicted to increase over time with the aging of the baby boomer population,¹⁰ we document past year non-prescription use and correlates of use in this sample. We explore its association with substance use, demographic, and selected physical and mental health variables. Finally, we estimate the prevalence of 12-month pain reliever use disorders (abuse or dependence) among all respondents and among the subset of respondents who reported non-prescription use of pain relievers in the past year.

METHODS

Sample

This study is based on data from the public use files of the 2005-2006 National Surveys on Drug Use and Health (NSDUH).^{11, 12} The annual survey provides population estimates of substance use and health status of the civilian, non-institutionalized population aged 12 years or older in the United States and the District of Columbia. Target participants were selected for participation utilizing multistage area probability sampling methods. The sample included household residents; residents of shelters, rooming houses, college dormitories, migratory workers' camps, and halfway houses; and civilians residing on military bases. Slightly less than 2% of the US population, including active military personnel, residents of institutional group quarters (e.g., prisons, nursing homes, mental institutions, and long-term hospitals), and homeless persons not living in a shelter on the survey day were excluded.

Participants were interviewed in private at their places of residence. Confidentiality was stressed in all written and oral communications with potential respondents and respondents' names were not collected with the data. The data collection method involved the combination of computer-assisted personal interviewing (CAPI) and audio computer-assisted self-interviewing (ACASI) in order to increase the validity of respondents' reports of drug use behaviors.¹³ Demographic items were administered by the field interviewer via CAPI. The interview then was transitioned to the ACASI mode, which provided respondents with a highly private and confidential setting in which to answer sensitive questions (e.g., use of alcohol and other drugs). Specifically, questions were displayed on a computer screen and read through headphones to respondents who entered answers directly into the computer.

A total of 68,308 respondents completed the survey in 2005, and 67,802 respondents completed the survey in 2006. Weighted response rates for interviewing were 76% in 2005 and 74% in 2006. The 2005-2006 NSDUH targeted the same civilian, non-institutionalized population and employed the same multistage probability sampling designs and data collection methods (i.e., a computer-assisted administration). In 2006, the survey team conducted a study to assess the reliability of respondents' response to the survey and found a good level of consistency in measures of substance use and mental health.¹¹ The study sample for each annual, independent survey is considered representative of the U.S. general population aged 12 or older. NSDUH design and data collection procedures are reported in detail elsewhere.^{11, 12}

In this report, we combined data from the two survey years in order to increase statistical power. Data analyses were based on the same variables from the two years and were restricted to the 10,953 respondents 50 years of age and older (6,717 respondents 50-64 years of age and 4,236 respondents 65+ years of age). The sample size of each age year of adults (e.g., respondents 64 years of age) was not available from the public-use data files.

Study Variables

Social and demographic variables—We examined respondents' age, sex, race/ethnicity, educational level, current marital status, current employment status, annual family income, and the population density of the area in which the respondent resided. Population density was classified into large metropolitan areas (population \geq 1 million), small metropolitan areas (population $<$ 1 million), and non-metropolitan areas (outside a standard metropolitan statistical area).¹¹ We also created a categorical survey year variable in order to examine yearly variations in the distribution of demographic and pain reliever use variables.

Prescription drug use variables—The NSDUH assessments of non-prescription use of prescription drugs included a detailed verbal description of the four drug classes (i.e., prescription pain relievers, sedatives, tranquilizers, and stimulants) and lists of qualifying drugs of each group. Non-prescription use of pain relievers was defined as any self-reported use of prescription pain relievers that was not prescribed for the respondent, or that the respondent took only for the experience or feeling they caused.^{14, 15} Respondents were read the following statement: “These questions are about nonmedical use. We are not interested in your use of ‘over-the-counter’ pain relievers such as aspirin, Tylenol®, or Advil® that can be bought in drug stores or grocery stores without a doctor's prescription.” Interviewers also showed a pill card to the respondents and read the following: “Card A shows pictures of some different kinds of prescription pain relievers and lists the names of some others. These pictures show only pills, but we are interested in your use of any form of prescription pain relievers that were not prescribed for you or that you took only for the experience or feeling they caused.”

The following 21 categories of prescription pain relievers were listed on Pill Card A: 1) Darvocet®, Darvon®, or Tylenol® with codeine; 2) Percocet®, Percodan®, or Tylox®; 3) Vicodin®, Lortab®, Lorcet®, or Lorcet Plus®; 4) codeine; 5) Demerol®; 6) Dilaudid®; 7) Fioricet®; 8) Fiorinal®; 9) hydrocodone; 10) methadone; 11) morphine; 12) OxyContin®; 13) Phenaphen® with codeine; 14) propoxyphene; 15) SK-65®; 16) Stadol®; 17) Talacen®; 18) Talwin®; 19) Talwin NX®; 20) tramadol; and 21) Ultram®. Separate questions were presented to respondents to assess their use. For example, respondents were asked “Have you ever, even once, used Darvocet®, Darvon®, or Tylenol® with codeine that was not prescribed for you, or that you took only for the experience or feeling it caused?” The survey also assessed respondents’ age at first non-prescription use (onset) of any prescription pain relievers and the number of days of using prescription pain relievers in the past 12 months. In this report, we focused on any past year (recent or active) non-prescription use of prescription pain relievers within the past 12 months preceding the interview.

Prescription pain reliever abuse and dependence variables—Past year abuse of and dependence on prescription pain relievers were specified by DSM-IV criteria.^{12, 15} The following four abuse criteria were included: (1) a serious problems at home, work, or school caused by using pain relievers; (2) regular consumption of pain relievers that put the user in physical danger; (3) repeated use of pain relievers that caused the user to get in trouble with the law; and (4) problems with family or friends caused by the continued use of pain relievers. The following seven dependence criteria were assessed: (1) using the same amount of pain relievers with decreasing effects, or increasing use to get the same desired effects as previously attained; (2) withdrawal; (3) using pain relievers more often than intended or being unable to maintain limits on use; (4) inability to reduce or stop pain reliever use; (5) spending a great deal of time over a period of a month getting, using, or getting over effects of pain relievers; (6) reduced involvement or participation in important activities because of pain reliever use; (7) continued pain reliever use despite having problems with emotions, nerves, or mental or physical health.

Other substance use and health-related variables—Respondents’ self-reported use of alcohol and any marijuana (hashish, pot, or grass) in the past 12 months was dichotomized. Assessment of major depressive episodes was based on DSM-IV criteria¹⁶ and adapted from the depression section of the National Comorbidity Survey-Replication.¹² The NSDUH assessed nine criteria of major depressive episodes: depressed mood most of the day, markedly diminished interest or pleasure in all or almost all activities most of the day, changes in appetite or weight, insomnia or hypersomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, diminished ability to concentrate or make decisions, and recurrent thoughts or plans for suicide. Adults who had

≥ 5 criterion symptoms in their lifetime and who also reported that they had a period of depression lasting two weeks or longer while also having some of the symptoms mentioned during the past 12 months were classified as having a past year major depressive episode. Health-related variables included respondents' self-rated overall health (excellent/good vs. fair/poor), cirrhosis, heart disease, lung cancer, pancreatitis, and ulcer. The last five variables were assessed by five discrete questions ("Did a doctor or other medical professional tell you that you had [name of the diagnosis] in the past 12 months?"). Each of the health variables was dichotomized.

Data Analysis

We first examined the distributions of demographic variables and the 12-month prevalence of non-prescription pain reliever use by survey year ($N = 5,123$ in 2005; $N = 5,830$ in 2006). We found no significant yearly differences in each of these variables, we then examined the prevalence and correlates of non-prescription pain reliever use in the combined data ($N = 10,953$). Within the subsample of adults who reported past year non-prescription pain reliever use ($n = 155$), we also determined their pattern and frequency of non-prescription use. Bivariate associations of each study variable with non-prescription use were tested by χ^2 tests. Logistic regression procedures were conducted to identify the characteristics associated with respondents' non-prescription use. Due to a small sample size of pain reliever users, only variables with a p-value less than 0.06 from bivariate analysis were included in the adjusted model. We report adjusted odds ratios of each covariate from the logistic regression model that denote the estimated strengths of an association between a covariate and the non-prescription use.

Lastly, we examined the prevalence of abuse of and dependence on prescription pain relievers among all respondents and in the subsample of respondents who reported non-prescription use in the past year. Because of the use of data from multiple survey years, the pooled data were sorted by the sample design variables as documented by the survey, and a new analysis weight variable was created by dividing the original final weight variable by the number of years of combined data and it was then used in the analysis of the pooled data. All statistical analyses were conducted by SUDAAN – a software designed specifically for analyzing data from surveys with complex design features.¹⁷ All estimates presented here are weighted except for sample sizes, which are unweighted.

RESULTS

Approximately 1.4% ($n = 155$) of respondents aged 50 or older reported non-prescription use of prescription pain relievers within the past 12 months preceding the interview. In contrast, 12-month prevalence of non-prescription use of prescription sedatives (0.14%), tranquilizers (0.46%), and stimulants (0.16%) in this sample was low. Hence, this report focuses on prescription pain relievers.

We report in Table 1 the prevalence of non-prescription use by study variables. Non-prescription use was more prevalent in the 50-64 age group (1.9%), males (1.7%), American Indians/Alaska Natives (9.0%), and users of alcohol (1.7%) or marijuana (10.7%) than the older group, females, African Americans, individuals reporting multiple race, and non-users of alcohol or marijuana. None of health-related variables was significantly associated with non-prescription use.

We then examined the pattern of non-prescription use among the 155 respondents (1.4% of the sample) who reported past year use of non-prescription pain relievers (Table 2). Propoxyphene, hydrocodone, oxycodone, and codeine products were more commonly used than the other categories: "Darvocet®, Darvon®, or Tylenol® with codeine" (ever used by

66% of users), “Vicodin®, Lortab®, Lorcet®, or Lorcet Plus®” (43%), “Percocet®, Percodan®, or Tylox®” (35%), generic hydrocodone (19%), generic codeine (16%), and OxyContin® (8%). Half (51%) of all users had ever used more than one category of pain relievers. The majority (88%) of users reported that their first non-prescription use occurred in adulthood (≥ 18 years), and one-fifth (21%) initiated the use at age 50 or older. Half (50%) of all users reported using the drugs on 12 or more days in the past year (mean = 34.84 days).

In Table 3, adjusted odds ratios (AOR) of non-prescription use are presented. Increased odds of non-prescription use were found among respondents aged 50-64 (AOR = 2.39, 95% CI = 1.31-4.36), American Indians/Alaska natives (AOR = 8.78, 95% CI = 2.50-30.85; relative to African Americans), and marijuana users (AOR = 7.07, 95% CI = 3.99-12.53), and these findings were independent of the influences of respondents' sex, alcohol use, and past year status of major depressive episodes. We explored whether age group might be an effect modifier in associations of sex, alcohol use, marijuana use, and major depressive episode with non-prescription use. None of these interactions was significant.

The overall 12-month prevalence of abuse of or dependence on prescription pain relievers among all respondents was low (0.13%). In the subsample of non-prescription users ($n = 155$), 1.7% met criteria for abuse and an additional 7.6% met criteria for dependence within the past 12 months. Therefore, the risk of prescription pain reliever dependence was comparatively high (one in 13 users) compared with the risk for abuse among users. The combined prevalence of abuse and dependence among users was 9.4%.

DISCUSSION

Overall, the prevalence of non-prescription use of prescription pain relievers is quite low in the general population in the 50+ age group. Yet the estimates are considerably higher in the 50-64 age group compared to the 65+ age groups. Given that the peak of reported chronic pain frequency in the general population is in the 65+ age group,^{4, 8} the current middle aged cohort as it ages may experience a much higher use than currently, something that clinicians working with older adults must carefully evaluate. The much higher frequency of use in American Indians/Alaska Natives is especially of concern. The explanation for the especially high risk in this racial/ethnic group is unknown and to our knowledge has not been reported among middle-aged and older adults to date.

As expected, non-prescription use of prescription pain medications was significantly comorbid with marijuana use, as well as alcohol use. In contrast to previous surveys of younger adults,¹ in these controlled analyses, non-prescription use was no more common in males than females. It should be remembered that chronic pain in the 50+ age group is more frequent in females than males.⁴

These findings should be interpreted with some caution. First, the cross-sectional nature of our data precludes drawing causal inference related to the associations we have reported. Second, data on non-prescription pain reliever use are obtained from respondents' self-reports, which are subject to a variety of biases associated with memory errors and under-reporting.¹⁸ While little is presently known about the reliability of self-reported non-prescription use of pain relievers in the elderly population, results from studies of survey respondents and drug-using subgroups suggest that under-reporting may have account for the low prevalence of non-prescription use in this sample.^{18, 19} Third, individuals who were institutionalized (e.g., in jails or long-term hospitals) or homeless on the date of the survey, as well as active military personnel, are not covered by the NSDUH sampling. These findings thus do not apply to them and some settings may contain a higher frequency of use

than the community. In addition, individuals who suffered from serious consequences from drug use might not be included in the sampling frame of a household survey, or may otherwise have been unable to participate in it, which may be related to the low rate of non-prescription use in this study. As noted above, older adults in clinic settings, especially those focused on the treatment of chronic pain from a variety of sources, appear to have much higher frequency of non-prescription use of these medications.

Further, although the NSDUH *explicitly* listed significantly more categories of pain relievers than any other national surveys of Americans, 20–21 the 21 categories of pain relievers specified in the survey are not entirely inclusive. There are a few pain relievers that are not listed by the survey (e.g., fentanyl and levorphanol). Finally, those aged 65 or older is likely to constitute a very heterogeneous group. However, the survey does not include individual age year in the public use data files that precludes us from further examining this group.

In conclusion, data from the NSDUH suggests that the frequency of non-prescription use of prescription pain medications among the 65+ age group is very low. However, the much greater frequency in the 50–64 age group could be a portent of much higher non-prescription use of these drugs as the baby boom cohort ages. These trends should be watched closely and the availability of yearly NSDUH data makes this possible.

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Table 1

Twelve-month Prevalence of Non-prescription use of Prescription Pain Relievers among Adults Aged 50 or Older in 2005–2006: By Demographic, Substance Use, and Health Variables

(N = 10,953)		
Study variables	Study Sample	Non-prescription use
	% (N)	% (SE)
Age in years		
50-64	59.9 (6717)	1.9 (0.23)*
65 or older	41.1 (4236)	0.6 (0.16)
Sex		
Male	46.1 (4952)	1.7 (0.23) [†]
Female	53.9 (6001)	1.1 (0.17)
Race/ethnicity		
White	77.9 (8551)	1.3 (0.16)*
African American	9.6 (997)	1.1 (0.34)
American Indian or Alaska native	0.4 (121)	9.0 (4.08)
Asian, Pacific Islander, or native Hawaiian	3.2 (258)	1.6 (0.95)
Multiple race	1.1 (217)	0.2 (0.12)
Hispanic	7.8 (809)	1.9 (0.65)
Educational status		
Less than high school	18.1 (2030)	2.2 (0.49)
High school graduate	32.4 (3705)	1.0 (0.20)
College or more	49.5 (5218)	1.3 (0.21)
Marital status		
Married	64.1 (6844)	1.2 (0.18)
Separated, divorced, or widowed	30.7 (3442)	1.6 (0.26)
Never married	5.3 (667)	2.1 (0.71)
Current employment status		
Employed	50.0 (5623)	1.6 (0.24)
Not employed	50.0 (5330)	1.1 (0.17)
Total annual family income		
\$0–\$39,999	43.8 (5067)	1.6 (0.22)
\$40,000–\$74,999	28.9 (3218)	1.1 (0.21)
\$75,000+	27.3 (2668)	1.3 (0.29)
Population density		
Large metro areas	50.0 (4379)	1.4 (0.23)
Small metro areas	41.9 (5334)	1.5 (0.19)
Non-metro areas	8.2 (1240)	0.8 (0.33)
Past year alcohol use		
Yes	60.0 (6564)	1.7 (0.20)*
No	40.0 (4389)	0.9 (0.19)

(N = 10,953)		
Study variables	Study Sample	Non-prescription use
	% (N)	% (SE)
Past year marijuana use		
Yes	2.6 (290)	10.7 (2.27)*
No	97.4 (10663)	1.1 (0.14)
Past year major depressive episode [†]		
Yes	4.9 (601)	2.9 (0.72) [†]
No	95.1 (10259)	1.3 (0.16)
Perceived health status		
Excellent/good	79.9 (8687)	1.3 (0.17)
Fair/poor	20.1 (2262)	1.8 (0.35)
Past year cirrhosis [†]		
Yes	0.2 (20)	0
No	99.8 (10856)	1.3 (0.14)
Past year heart disease [†]		
Yes	9.5 (1003)	0.9 (0.28)
No	90.5 (9864)	1.4 (0.16)
Past year lung cancer [†]		
Yes	0.2 (19)	0
No	99.8 (10857)	1.3 (0.14)
Past year pancreatitis [†]		
Yes	0.3 (34)	0
No	99.7 (10842)	1.3 (0.14)
Past year ulcer [†]		
Yes	1.4 (162)	0
No	98.6 (10714)	1.4 (0.14)
Survey year		
2005	49.1 (5123)	1.5 (0.23)
2006	50.9 (5830)	1.2 (0.19)

S.E.: standard error.

χ^2 test:

Due to multiple comparisons, only variables with a p-value less than 0.01 were considered statistically significant.

[†] Missing data (< 1%) were excluded.

[†] p < 0.05

* p < 0.01.

Table 2

Pattern of non-prescription use among past year non-prescription users of pain relievers aged 50 or older in 2005-2006 (N = 155)

Non-prescription pain relievers use in the lifetime ¹	% (SE)
Darvocet®, Darvon®, or Tylenol® with codeine ²	66.1 (4.90)
Vicodin®, Lortab®, Lorcet®, or Lorcet Plus®	42.8 (4.64)
Percocet®, Percodan®, or Tylox®	34.5 (5.23)
Hydrocodone	19.2 (3.65)
Codeine	16.1 (3.78)
OxyContin®	8.4 (3.08)
Methadone	6.8 (2.69)
Demerol®	5.7 (2.34)
Morphine	3.9 (1.89)
Dilaudid®	3.5 (1.83)
Fioricet®	3.1 (1.56)
Phenaphen® with codeine	2.2 (1.31)
Ultram®	2.2 (1.18)
Talwin®	2.0 (1.64)
Propoxyphene	2.0 (1.15)
Stadol®	0.03 (0.03)
Tramadol	0
Fiorinal®	0
SK-65®	0
Talacen®	0
Talwin® NX	0
<hr/>	
Number of different types of prescription pain relievers used ¹ , %	
1	48.8 (5.50)
2	20.4 (4.31)
3 or more pain relievers	30.7 (4.59)
<hr/>	
Age of first non-prescription use of prescription pain relievers, %	
< 18 years	12.5 (3.81)
18-39	51.0 (4.99)
40-49	15.5 (3.24)
50 or older	21.0 (3.88)
<hr/>	
Total number of days using prescription pain relievers in the past year (non-prescription use), %	
1-5 days	39.8 (5.22)
6-11	10.1 (2.66)
≥ 12	50.1 (5.25)
Mean number of days, Mean	34.8 (5.82) ³

S.E.: standard error.

¹Based on the 21 separate questions on types of prescription pain relievers used.

²The survey combines Tylenol with codeine with Darvocet and Darvon (propoxyphene products) into a one question.

³Mean number of days using prescription pain relievers in the past year.

Table 3

Adjusted Odds Ratios (AOR) and 95% Confidence Intervals (CI) of Past Year Non-prescription use of Prescription Pain Relievers Among Adults Aged 50 or Older in 2005–2006 (N = 10,953)

Logistic regression model ¹	AOR	95% CI
Age in years (vs. 65 or older)		
50–64	2.39*	1.31–4.36
Sex (vs. female)		
Male	1.24	0.84–1.82
Race/ethnicity (vs. African American)		
White	1.28	0.63–2.61
American Indian or Alaska native	8.78*	2.50–30.85
Asian, Pacific Islander, or native Hawaiian	1.92	0.46–7.98
Multiple race	0.17*	0.04–0.71
Hispanic	1.97	0.74–5.22
Past year alcohol use (vs. no)		
Yes	1.59	0.97–2.60
Past year marijuana use (vs. no)		
Yes	7.07*	3.99–12.53
Past year major depressive episode (vs. no)		
Yes	1.72	0.90–3.29

* : p-values < 0.05.

¹ The model included all variables listed in the first column; due to a small sample size of pain reliever users, only variables with a p-value less than 0.06 from bivariate analysis were included in the adjusted model.