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Nonmedical Use of Prescription Opioids: Motive and Ubiquity Issues

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Abstract

Two issues relating to prescription opioid nonmedical use that to our knowledge have not been comprehensively addressed in the peer-reviewed literature are discussed: Motives for nonmedical use and the extent of nonmedical use of prescription opioids in other countries. The United States' national annual survey on illicit drug use in the general population (National Survey on Drug Use and Health) asks respondents whether they have used prescription opioids for nonmedical purposes but does not assess motives for such use. By not assessing motives, nonmedical users who use only for pain relief and nonmedical users who have other motives for use are grouped together, but 2 recent epidemiological studies suggest that these 2 groups may differ in a propensity to have substance use–related problems. We suggest that the survey add a question that assesses motives for nonmedical use. Regarding whether countries besides the United States have problems associated with nonmedical use of prescription opioids, after searching for epidemiological surveys and other materials potentially relevant to this issue, we were unable to determine the extent of nonmedical use of prescription opioids in other countries or draw cross-national comparisons. We suggest that more countries include specific questions about nonmedical use of prescription opioids in their national epidemiological surveys.

Perspective—We believe that critical information surrounding the nonmedical use of prescription opioids is not being gathered. Such information would allow for a better understanding of the problem. We invite discussion and commentaries regarding the issues we raise to more effectively address this public health issue.

Keywords

Prescription; opioid; nonmedical use; abuse; epidemiology; pain; international

This article will address 2 issues related to nonmedical use of prescription opioids. There are 3 drug use psurveys in the United States that assess non-medical use of these drugs, with differing definitions.[34,44,76] For reasons that will be described below, we will use the definition from the National Survey on Drug Use and Health (NSDUH),[76] which is, using a prescription pain reliever "even once, that was not prescribed for you, or that you took only for the experience or feeling it caused." We will use the term "nonmedical use" throughout the article; there are several other terms used in describing problematic use of prescription opioids, including the terms "extramedical use," "misuse," and "abuse." These terms mean different things to different people, and using them interchangeably is inappropriate and confusing.

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There is widespread acknowledgment that nonmedical use of prescription opioids is a significant problem in the United States. Nonmedical use of these pharmaceutical drugs has increased markedly over the last decade.[14,20,33,82] The significance of the problem has been demonstrated by results from national epidemiological surveys[44,74,76,77] and studies that have addressed demographics, risk factors, and estimated costs associated with the nonmedical use of prescription opioids.[8,21,30,65,69,78] Also available in the extant literature are commentaries, review articles, and conceptual papers on nonmedical use of prescription opioids.[18,35,45,46,64] Articles such as these will give the reader a snapshot of what we have learned and will bring to light some pressing issues that remain to be explored for us to better grasp the problem. The purpose of this Focus Article is to discuss 2 issues that have previously been raised in one forum or another but to our knowledge have not been fully addressed in the peer-reviewed literature:

- The College on Problems of Drug Dependence, the longest-standing research society in the United States addressing problems of drug dependence and abuse, commissioned a task force in 2001 to craft a position paper on nonmedical use and abuse of prescription opioids. The multidisciplinary taskforce included representatives from the scientific, regulatory, and medical fields. The position paper, published in 2003, made several recommendations, including to "initiate a national forum to review the existing taxonomy of terms related to the nonmedical use and abuse of prescription opioids and their impact on policy." (p. 230).[82] We believe the term "nonmedical use" deserves particular attention. The current definition as used by the NSDUH does not assess motives of nonmedical use (eg, to relieve pain vs to get "high"), and we present evidence that different motives (including the motive "to relieve pain") are associated with different degrees of substance abuse and abuse-related problems. We contend that the inclusion of motives for nonmedical use in the NSDUH would better inform those who monitor and make policies about issues surrounding nonmedical use of prescription opioids.
- Two officials at the National Institute on Drug Abuse (NIDA), part of the National Institutes of Health (NIH), wrote a commentary in a peer-reviewed journal that included a series of scientific questions that they deemed worthy of assessment.[18] In their words, "An additional concern is that the extent of opioid analgesic abuse in countries other than the United States is uncertain. Is the situation in the United States a harbinger of problems likely to be seen in other locations? Are there cross-national differences in opioid analgesic abuse, which may help to illuminate the causes of the increases in certain populations?" (p. 106). We agreed that these were important and interesting questions to ask, and so we examined different sources of data in an attempt to find answers. After searching for epidemiological surveys and other materials potentially relevant to this issue, we contend that the question of prevalence of nonmedical use of prescription opioids in other countries remains unanswered.

In addition to discussing these issues, we provide recommendations for ways to address the problems that we raise. It is our hope that this Focus Article will serve as a catalyst for discussion and commentary by others on issues we perceive as important relating to the problem of nonmedical use of prescription opioids.

The Need for Additional Questions Assessing Motives for Nonmedical Use of Prescription Opioids in the National Survey on Drug Use and Health

As stated earlier, there are 3 epidemiological surveys that assess for prevalence of nonmedical use of psychotherapeutic drugs (including prescription opioids) and illicit drugs in the United States: The NSDUH,[76] the Monitoring the Future (MTF) survey,[44] and the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC).[34] The MTF survey

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examines nonmedical use of psychotherapeutic drugs and use of illicit drugs in secondary school students. The NESARC was last conducted in 2001 and 2002 and assesses nonmedical use of psychotherapeutic drugs and use of illicit drugs in the general population as well as prevalence of substance use disorders and associated psychiatric and other medical comorbidities. We are focusing on the NSDUH and its definition of nonmedical use in this article because (1) the NSDUH is the most comprehensive and largest annual drug survey of the general population in the United States, and (2) a recent report has directly addressed the NSDUH definition of "nonmedical use" and the issue of pain relief,[16] which is the crux of this section.

Nonmedical Use and the Issue of Pain Relief

The NSDUH, formerly the National Household Survey on Drug Abuse (NHSDA), reports on estimates of illicit drug use among members of the civilian, noninstitution-alized population aged 12 years and older in the United States. The survey, established in 1971 and administered annually since 1990, is conducted in a respondent's place of residence, and, since 1999, has used computer-assisted interviewing. The NSDUH contains questions on prescribed psychotherapeutic agents, ie, stimulants, sedatives, tranquilizers, and pain relievers. ("Prescription pain relievers" in the NSDUH is synonymous with prescription opioid products, ie, opioids alone or opioids in combination with other drugs; for the sake of consistency in this article we will use the term "prescription opioid" rather than "prescription pain reliever.") Because these drugs are legal and have medical indications, their "inappropriate" use has been categorized as "non-medical." In the 2006 NSDUH report, lifetime (ever used), past year, and past month prevalence rates of nonmedical use of prescription opioids were 13.6%, 5.1%, and 2.1%, respectively.[76] These prevalence rates were higher than rates for use of cocaine, heroin, hallucinogens, inhalants, and the other 3 psychotherapeutic agents, and were only surpassed by rates for marijuana.

The NSDUH does not assess motives, or reasons, for nonmedical use of prescription opioids. One possible motive of particular interest to us is the very reason prescription opioids are prescribed by physicians: To relieve pain. The Substance Abuse and Mental Health Services Administration that funds the NSDUH recently issued a report that discussed pain in the context of the NSDUH definition of nonmedical use of prescription opioids.[16] Below are 2 excerpts, one on the nonmedical use of prescription opioids to treat pain (Chapter 8, p. 9), and the second on the nonmedical use of psychotherapeutic drugs (sedatives, stimulants, tranquilizers, opioids) in general (Chapter 1, p. 5).

- "Scenarios that may represent problematic use but may not necessarily constitute nonmedical use include use of a leftover prescription for a similar type of medical problem but not the one for which the medication was originally prescribed … For example, a person may have been prescribed a pain reliever when recovering from surgery but occasionally takes leftover medication for other pain relief; once all the medication has been taken, he or she does not ask the doctor for another prescription unless a new medical need should arise. This type of use probably would not constitute misuse if done with the knowledge or general guidance of a patient's doctor; due to issues mentioned previously however, such as potential interactions with other drugs, this could be problematic if done on a patient's own."
- "… the definition includes persons who (1) have an actual medical need for a certain class of drug but do not have a prescription for it and (2) are given a dose or two of a drug in that class by a friend or family member who has a legitimate prescription. This situation would be considered use without a prescription of the individual's own and would trigger a positive response to the item in the NSDUH prescription drug module, although the individual would not be using the drug simply for the feeling

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or experience it caused. Despite potential questions about whether users in this latter category are actually misusing the drug, these individuals are not likely to have been evaluated by a physician prior to taking the drug. A medical evaluation would take into account a person's particular characteristics and condition to determine the legitimacy of his or her need for medication, the appropriateness of the drug selection, and the appropriate dosage."

There is no doubt that taking a prescription opioid for its intended indication but without medical supervision should be discouraged. The problems of such use are elucidated in the excerpts above as well as in the peer-reviewed literature.[9,51] However, it is also acknowledged in the above excerpts that there could be some question as to whether such a motive for use constitutes nonmedical use. Changing the NSDUH definition of nonmedical use to exclude those who report taking a nonprescribed prescription opioid for only pain relief would be premature and problematic at this time. However, we question whether such use should be grouped together with other motives for nonmedical use, such as recreational use (eg, to experiment, to get "high"). The next section presents data that we hope convinces the reader that the issue we raise is not trivial.

Pain Relief as a Motive for Nonmedical Use of Prescription Opioids and Associated Substance Abuse or Dependence Problems

A Web-based survey conducted in 2005 assessed the prevalence of, motives for, and problems associated with nonmedical use of prescription opioids in college students (N = 4580) attending a large, 4-year Midwestern university.[51] Nonmedical use of prescription opioids was assessed with the following question: "On how many occasions in (a) your lifetime or (b) the past 12 months have you used the following types of drugs, not prescribed to you?" Respondents were presented with the term "pain medication," and 8 examples were given (eg, Vicodin [Abbott Laboratories, Abbott Park, IL], OxyContin [Purdue Pharma L.P., Stamford, CT], Percocet [Endo Pharmaceuticals, Chadds Ford, PA]). Respondents who reported lifetime nonmedical use of prescription opioids were then asked: "Please provide the reason(s) why you used pain medications not prescribed to you," and were shown a list of motives that included "because it relieves pain," "because it gives me a high," "because of experimentation," "because it helps me sleep," "because it helps decrease anxiety," "because it's safer than street drugs," "because it counteracts the effects of other drugs," and "because I'm addicted." Past month use of marijuana, cocaine, ecstasy, lysergic acid diethylamide (LSD), psychedelics other than LSD, heroin, crystal methamphetamine, and inhalants was assessed, as well as binge drinking (in the past 2 weeks). The CAGE[27,50] and the Drug Abuse Screening Test (DAST-10)[72] were also used to assess for problematic alcohol and drug use, respectively.

Lifetime and past-year prevalence rates of nonmedical use were 14.3% and 7.5%, respectively. Respondents were most likely to report, "because it relieves pain," as a reason for using prescription opioids not prescribed to them by a doctor (63% of all lifetime nonmedical users). Other common motives were "because it gives me a high" (31.9%) and "because of experimentation" (26.8%). These percentages come from lifetime nonmedical users but rank order of motives was the same for past-year nonmedical users. Of lifetime nonmedical users, 40% reported using prescription opioids only to relieve pain.

Perhaps most pertinent to our argument that the NS-DUH should add motives for nonmedical use of prescription opioids is the different relationship between motives (to relieve pain vs other reasons for use) and indicators of substance abuse and associated problems. For those 40% of lifetime nonmedical users who reported using prescription opioids only to relieve pain, their likelihood of binge drinking and alcohol problems (based on the CAGE) and their likelihood of experiencing 3 or more drug-related problems (based on the DAST-10) did not differ from students who reported no nonmedical use of prescription opioids. Experiencing 3

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or more problems as measured by the DAST-10 signals potential drug abuse or dependence,[15,32,49] and neither group showed such a signal. In contrast, the likelihood of binge drinking and alcohol problems was more than 2 times greater, and the likelihood of experiencing 3 or more drug use-related problems was more than 15 times greater among undergraduate students who reported other motives for nonmedical use compared to students who reported no nonmedical use of prescription opioids (differences were statistically significant, $P < .001$). It needs to be pointed out that "other motives" could include 1 motive that was not "pain relief" or 2 or more motives (one of which could have been "pain relief"). Finally, use of marijuana and other illicit drugs was slightly higher (adjusted odds ratio: 1.4 times) in those nonmedical users who reported use only for pain relief compared to students who reported no nonmedical use ($P < .05$). Use of marijuana and other illicit drugs was considerably higher (adjusted odds ratio: 7.7) in those nonmedical users who reported other motives compared with students who did not report nonmedical use of prescription opioids ($P < .001$). In summary, the motive of "pain relief" for nonmedical use of prescription opioids was prevalent in this college student sample, and this motive by itself was not associated with concurrent alcohol or drug use-related problems.

Another study from the same research group using a Web-based survey assessed prevalence of nonmedical use of prescription opioids and motives for use in students aged 12 to 18 years. The survey was conducted in 2005 in 7th through 12th graders (N = 1086) who attended schools in a racially diverse, public school district in the Detroit, Michigan metropolitan area.[9] Nonmedical use of prescription opioids, sedatives, tranquilizers, and stimulants was assessed as well as motives for use. Alcohol, marijuana, and illicit drug use was assessed using questions derived from the MTF survey.[44] Risk of substance abuse was assessed with the DAST-10. Lifetime and past-year prevalence of nonmedical use of prescription opioids was 16.9% and 12%, respectively. The vast majority, 79%, of past-year nonmedical users reported pain relief as at least 1 of the motives for nonmedical use; the motive "because it gives me a high" was reported by 11% of respondents. The 68% (n = 86) of past-year non-medical prescription opioid users who reported using only for pain relief were compared with the 32% (n = 41) of users whose motive was not pain relief or who had 2 or more motives (1 of which could have been pain relief) on measures relating to drug use and problems associated with drug use. Frequency of marijuana and alcohol use was significantly higher in the latter group, as was evidence of binge drinking. DAST scores were significantly higher in the latter group and their mean score (3.9) exceeded the cutoff indicating a potential risk for substance abuse or dependence. These results from a younger cohort of respondents than those in the Mc-Cabe et al study[51] yielded similar results. That is, the majority of nonmedical users of prescription opioids endorsed pain relief as a motive for using. Rates of illicit substance use and associated problems were lower among nonmedical users whose motive was solely to relieve pain than among those with other or additional motives for use.

Current Definition Precludes Analyzing Additional Information About Nonmedical Users of Prescription Opioids With Different Motives for Use

Studies by McCabe et al[51] and Boyd et al[9] appear to be unique in the extant peer-reviewed literature in that they assessed motives for use of prescription opioids and perhaps more importantly, whether or not motives were associated with substance use-related problems. Their surveys were limited in geographical locale and to young people, and more surveys of this type are needed to determine whether their findings can be replicated in the general population. Even with these caveats, however, the 2 studies generated results that call into question the NSDUH definition of "nonmedical use" of prescription opioids, that is, because the definition does not assess motives for nonmedical use.

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The current definition equates a person in pain who takes a prescription opioid originally prescribed for someone else with a person who takes prescription opioids recreationally (eg, to get "high"). When conducting research that focuses on nonmedical users of prescription opioids using NSDUH data,[16,21,78] not only are the demographics of individuals with these different motives combined but also combined is information on other critical variables assessed by the NSDUH: Current and past use of illicit drugs; pattern of drinking alcohol; and factors that characterize Opioid Use/Dependence Disorder, other substance use disorders, or mental health disorders.[76] The McCabe et al[51] and Boyd et al[9] studies indicate that nonmedical users who only seek pain relief can be distinguished from nonmedical users with "other motives" on important markers of substance abuse. Furthermore, a substantial percentage of nonmedical users in both studies reported using only to relieve pain. If a substantial proportion of people categorized as non-medical users take a prescription opioid only for pain relief, then the information as currently reported by the NSDUH may not accurately represent the different subgroups of nonmedical users of prescription opioids. Equating nonmedical users of opioids whose motives are so disparate may underestimate the prevalence of substance use and abuse-related disorders or mental health problems in those whose use is not prompted by pain. These suppositions cannot be tested with the current NSDUH definition of "nonmedical use of prescription pain relievers."

We should know more about nonmedical users of prescription opioids who do not use them to relieve pain; these may be the users who are particularly susceptible to problems such as other illicit drug use and mental health disorders. Policy makers may be most interested in knowing more about these users so that efforts and resources can be appropriately allocated.

Recommendations

Other scientists have raised concerns about the omission of "motives for use" in the current NSDUH definition of nonmedical use of prescription opioids[21,45] as well as predicting that different kinds of nonmedical use (ie, using a prescription medication to treat a physical condition vs to achieve a state of intoxication) would be associated with different epidemiological outcomes.[9,17,51] Those who are or have been involved with administration and development of the NSDUH survey throughout the years have visited and revisited the phraseology of "nonmedical use," including whether taking nonprescribed opioids for "pain relief" constitutes nonmedical use.[16] We would recommend the following: Just as the NSDUH officials added a new question to the 2005 survey on sources of prescription opioids for nonmedical use,[75] another question should be added on motives for nonmedical use. The definition of "nonmedical use" would remain intact. The new question could be framed along the lines of those used by McCabe et al[51] and Boyd et al.[9] By adding a question on motives, analyses can be done to determine if pain-related motives are associated with different epidemiological outcomes relative to other motives.[17] Although the addition of a question to the survey raises potential problems inherent in adding, revising, or deleting questions or a section of the survey, NSDUH officials have described the steps for making changes to ensure the integrity of the survey.[16]

We are putting forth a recommendation to add a question on motives, but we understand such an addition would need to be discussed by a number of experts in different fields. We suggest that perhaps initially a summit meeting be convened to facilitate dialog and discussion on this subject. Meeting participants might include, but not necessarily be limited to, the following experts: those involved in the design of the NSDUH and other national drug abuse surveys; NIDA officials; NIH and NIH grant recipients who study different facets of nonmedical use of prescription opioids; pain societies including the American Pain Society; and addiction societies such as the American Society of Addiction Medicine. We would hope that this article serves as a catalyst for such a meeting to take place.

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Prescription Opioid Nonmedical Use in Countries Other Than the United States

Do National Surveys From Other Countries Address Nonmedical Use of Prescription Opioids?

In the Introduction, we cited a commentary paper by Compton and Volkow[18] in which they asked the following 2 questions on nonmedical use of prescription opioids: "Is the situation in the United States a harbinger of problems likely to be seen in other locations? Are there cross-national differences in opioid analgesic abuse, which may help to illuminate the causes of the increases in certain populations?" We sought out national epidemiological surveys on drug abuse from other countries in an effort to address these interesting and important questions. Although other sources inform on illicit drug use (eg, school surveys, treatment and drug seizure data), we chose to look at nationwide surveys of the general population in the hopes that we could find comparable data representative of the entire country, rather than indirect measurements or specific sub-groups. Due to the potential scope of this analysis (there are currently 268 nations, dependent areas, and other entities[11]), we limited our investigation using data from the International Narcotics Control Board (INCB).

The INCB is the independent and quasijudicial monitoring body for the implementation of the United Nations international drug control conventions and was established in 1968 in accordance with the Single Convention on Narcotic Drugs, 1961.[41] Countries that adhere to the Convention must submit to the INCB annual statistical reports of consumption levels of certain narcotics (termed Schedule I and II), including opioids, so that quotas can be established for those narcotic drugs. The INCB, in its annual reports, provides statistical data on the consumption of opioids for those countries; the latest report at the time of this writing provides such data from 2003 to 2005.[42,43] Consumption levels are reported in defined daily doses for statistical purposes (S-DDD) per million inhabitants per day. Drugs included in consumption levels are codeine, fentanyl, hydrocodone, hydromorphone, methadone, morphine, oxycodone, pethidine [meperidine], tilidine, and "others," and S-DDD values are reported in the aggregate and per drug. Although the INCB notes that there is a degree of arbitrariness to the S-DDD values and variability in usage by different countries (in both dose and purpose), they also assert that the values can be used to compare consumption levels of opioids both in the aggregate and for specific opioids (listed above) between countries.[42]

We chose to focus our attention on the top 25 countries consuming opioids (of the 190 countries or territories that reported consumption levels to the INCB), based on 2 assumptions: (1) Those countries with higher consumption rates of opioids would have more prescription opioid products available; and (2) signals of nonmedical use of prescription opioids would be more likely to be found in countries with greater availability of prescription opioids than those countries with lower availability. Regarding the second assumption, there is data from the United States showing that as the licit use of prescription opioids increases, there is a corresponding increase in illicit use, presumably because there are more opioids available for diversion.[14,20,33,82] Whether greater availability of prescription opioids for licit purposes is accompanied by greater nonmedical use of such drugs in other countries has yet to be determined, and was a question of interest in our investigation.

Table 1 lists countries in descending order of aggregate consumption of opioids and the most recent national epidemiological survey on drug use prevalence (studies that inquired about use of such drugs as cocaine, heroin, ecstasy, hallucinogens, and/or cannabis) conducted in the general population that we were able to find as of the writing of this article, including age of participants surveyed, sampling technique, and whether and how nonmedical use of prescription opioids were assessed.[1,3,5–7,29,36,40,47,48,53–56,58,59,66–68,71,76,79,81]

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Our search for national surveys primarily involved the use of the World Wide Web. We were able to ascertain that 23 of the 25 countries in Table 1 have conducted national drug abuse surveys at least once in the last 9 years. The sources we were able to locate are referenced in the table and include governmental reports and journal articles that describe the survey and its results. A number of the reports and articles were not written in English, and in cases in which we were not sure of whether or how non-medical use of prescription opioids were assessed, we wrote e-mails to officials from organizations that were involved in developing or reporting results of the survey. Based on our search techniques, we were able to ascertain whether 20 of the 23 countries that administered drug abuse surveys assessed nonmedical use of prescription opioids. Two countries may have (Switzerland and Finland). We could not access reports from Iceland.

Of the 20 countries, based on our analyses, 6 provided prevalence rates of nonmedical use of prescription opioids separate from other drugs used licitly or illicitly: The United States, Germany, Spain, Australia, New Zealand, and England and Wales (the latter 2 United Kingdom countries were combined in the survey). However, among these countries, cross-national comparisons of prevalence rates are difficult to make for at least 2 reasons. One reason is that 2 countries provided prevalence data on specific opioids (New Zealand and England/Wales), whereas the United States provided data for the class of prescription opioids as a whole. (Nonmedical use of OxyContin [Purdue Pharma L.P.] in the United States is assessed separately, but its nonmedical use is also reflected in the overall prevalence data. Prevalence of use of other specific opioid products are also assessed but only for lifetime use.) A second reason is that in Germany, Spain, and Australia, examples of opioids given to respondents differed, and in the case of Spain, we are not clear what, if any examples respondents were given. It is not clear if Switzerland and Finland asked respondents about nonmedical use of prescription opioids. Their reports listed prevalence rates of “Other” and “sedatives, tranquilizers, and painkillers,” respectively. If nonmedical use of prescription opioids were assessed under those categories, the prevalence rates as presented in their reports did not represent specifically nonmedical use of prescription opioids. Australia assessed for non-medical use of “pain-killers, analgesics,” but examples given to respondents grouped non-opioid painkillers with an opioid combination product (Mersyndol [Sanofi-Aventis, Bridgewater, NJ], which contains codeine and acetaminophen), again making prevalence rates for opioids impossible to parse out. Ireland and Northern Ire-land had questions regarding use (including medical and potential nonmedical use), so prevalence rates listed in their report do not inform on, specifically, prescription opioid nonmedical use. Based on our analyses, 13 countries did not include any questions that would inform on nonmedical use of prescription opioids. In summary, the inconsistencies in whether and how nonmedical use of prescription opioids was assessed in the top 25 countries consuming opioids precludes cross-national comparisons from being made. More importantly, the inconsistencies also prevented us from making definitive conclusions as to whether nonmedical use of prescription opioids is or is not a problem in these countries (with the exception of the United States).

Is There Any Evidence to Inform on Nonmedical Use of Prescription Opioids in Other Countries?

One possibility for the lack of questions pertaining to nonmedical use of prescription opioids on some countries’ nationwide surveys is that perhaps nonmedical use was simply not a problem in their respective country. We therefore sought out other surveys or reports conducted in these countries that might inform on nonmedical use of prescription opioids.

The majority of countries listed in Table 1 are European. Seventeen of the countries listed in Table 1 provide annual reports to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA); the EMCDDA collects, analyzes, and disseminates data from

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European countries (29 as of 2006) on several indicators of drug use including household surveys of the general population aged 15 to 64 years, as well as other indicators of drug use (eg, demand for drug treatment, drug-related deaths).[26] Information is collected through a European information network on drugs and drug addiction (Reitox national focal points) according to EMCDDA standards and submitted to the EMCDDA in an annual report. In their 2005 or 2006 national reports to the EMCDDA, Denmark, Sweden, and Belgium indicated some degree of nonmedical use of prescription opioids in their respective countries. Denmark reported an increase in hospital visits from 1999 to 2004 from intoxication or poisoning of "other opioids" and that "other opioids" ranked third behind heroin and cannabis among primary substances of abuse for individuals admitted for treatment.[55] Sweden's 2005 report identified an information system of people entering various drug treatments in 2004 (KIM: "Clients in Treatment"); 11.8% of women and 5% of men reported "other opiates" (described as primarily painkillers) as the main drug registered for treatment of abuse.[57] All respondents to a 2005 Snowball Survey in Belgium's French community (a yearly survey that interviews drug users in various regions) reported use of illegal medicines; 36% used methadone, 12% buprenorphine, and 17% codeine.[54] Several European countries including Finland, France, Germany, and Norway reported that sublingual buprenorphine tablets, used primarily as a pharmacotherapy for opioid detoxification or maintenance, but also for pain relief, were being used nonmedically.[31,52,63,70]

Australia's Illicit Drug Reporting System is designed to serve as an early warning system to identify emerging drug trends by triangulating data from injecting drug users, information from key experts, and data from surveys and seizures. According to its 2006 report,[61] data suggest growing nonmedical use of pharmaceutical opioids, especially morphine, methadone, buprenorphine, and oxycodone.

Canada, third on the list of opioid consumption in Table 1, has conducted several studies that inform on non-medical use of prescription opioids.[1,2,28] For example, in response to the increasing nonmedical use of prescription opioids identified in secondary school students in America's MTF survey, Canada's Centre for Addiction and Mental Health included OxyContin [Purdue Pharma L.P.] for the first time in its 2005 Ontario Student Drug Use Survey.[2] Ontario students were less likely than American students to use OxyContin [Purdue Pharma L.P.], especially 12th graders (past-year use 1.4% vs 5.0%, respectively). In a 2005 survey of illicit opioid users not in a drug treatment program (in the past 6 months) in 7 Canadian cities (OPICAN study), a marked difference was found in the type of opioid used; in Vancouver and Montreal heroin was the most commonly used opioid, but in 4 other sites heroin use was in the minority, whereas prescription opioids were used by a majority of the sites' participants.[28] The authors stated: "the use of prescription opioids in varying forms has become the predominant form of illicit opioid use" (p. 1386).

In summary, evidence from different sources indicates that countries other than the United States are experiencing some degree of nonmedical use of prescription opioids. Beyond that, the full extent of such nonmedical use within any specific country cannot be reported because of the limited scope of the subpopulation assessed. Differences in terminology and methodology also preclude intercountry comparisons.

Why Don't More National Surveys From Other Countries Address Nonmedical Use of Prescription Opioids, and Are More Countries Planning to Do So?

The information currently available from the most recent epidemiological studies does not allow for cross-national comparisons to be drawn or trends to be assessed. Although there are indications that nonmedical use of prescription opioids may be (or may be becoming) a problem in other countries, we cannot determine the extent of the problem because in many cases

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relevant questions are not being asked on the national level and on a regular basis to specifically address this issue.

As mentioned previously, 17 of the countries in Table 1 report to the EMCDDA, and most of these countries do not provide results from their nationwide surveys that allow for a clear assessment of the prevalence of non-medical use of prescription opioids within their borders. The EMCDDA is a substantial source of comparable information on European countries because it provides guidelines to each country on the collection, analysis, and reporting of data in national surveys such as recommending the target population surveyed be 15 to 64 years of age and including cannabis, ecstasy, amphetamines, cocaine, heroin, and LSD in the questionnaires. These drugs are included among the "core items" as part of the "European Model Questionnaire," which serves as a guideline for national surveys.[23] Notably, the European Model Questionnaire at the time of this writing does not include questions on potential nonmedical use of prescription opioids. The EMCDDA acknowledged the complexity of addressing the issue of the illicit use of medicines ("pharmaceuticals"); its expert group concluded "that it was not feasible to construct straightforward, cost-effective questions that would be comparable throughout Europe. Hence, for the time being questions about pharmaceutical drugs have been classified as optional" (p. 86).[25] The expert group later stated that "although many drug prevalence surveys in the past have included some questions on this item (ie, pharmaceutical use), very few studies have so far investigated the meaning of taking medicines in the context of illicit drug use. Also, the methods used for asking questions about medicines are more varied than when assessing the prevalence of illicit drug use … It was also concluded that, in the context of illicit drug use, the item could be restricted to sedatives and tranquilizers" (p. 27).[24]

Acting in a similar capacity as the EMCDDA, the Canadian Community Epidemiology Network on Drug Use (CCENDU) collects, interprets, and disseminates information on drug use among Canadians by collecting information such as prevalence of drug use (including cannabis, heroin, and hallucinogens), drug treatment data, and morbidity data from local sites.[10] CCENDU recognized the lack of research and data on nonmedical use of prescription drugs, including prescription opioids, and lack of standardization in local site reports. As a result they did not present data on the topic in their 2002 national report. There are encouraging signs, though, that Canada will assess nonmedical use of prescription drugs, including opioids, in future surveys.[38,39]

In their most recent report, the INCB urged that prescription pharmaceutical abuse be systematically evaluated in countries' national surveys on illicit use of drugs (paragraph 58 of report): "Diversion and abuse of narcotic drugs in the form of pharmaceutical preparations continue to be underreported, in particular, if they involve preparations that may be exempted from certain control measures (preparations in Schedule III of the 1961 Convention). Many States have not established any mechanism for the systematic collection of data on those issues and are not aware of the extent of diversion and abuse of pharmaceutical preparations containing narcotic drugs in their territories … Abuse of pharmaceutical preparations should be included in the surveys aimed at establishing the extent and types of drug abuse."[43] It should be noted that although the quote may be alluding to all pharmaceutical preparations, 3 preceding paragraphs in the report discuss the diversion and abuse of prescription opioids.

Recommendations

Many countries throughout the world have epidemiological surveys that assess for prevalence of illicit use of drugs such as cannabis, heroin, and cocaine. Few of these countries assess for prevalence of nonmedical use of prescription opioids. However, as discussed earlier, there are reports from a number of countries indicating that prescription opioids are being used nonmedically. We would recommend that those countries with annual surveys that assess for

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prevalence of use of illicit drugs, and that also have reports emanating from their countries indicating nonmedical use of prescription opioids, add questions to their surveys to capture the prevalence of such nonmedical use. We are not the first to proffer such a recommendation.[43]

However, "the devil is in the details." Although we recommend that questions be added, we understand that some sort of standardization of questions assessing prevalence is necessary. A United Nations global workshop on drug information systems in 2001 called for "development of a glossary of drug epidemiology terms and definitions to facilitate consensus on definitions and terms used in drug abuse epidemiology across regions and different drug information systems." (p. viii).[80] This could best be accomplished by an international working group composed of experts in drug abuse surveys (eg, EMCDDA, NSDUH) meeting and going through the predicted arduous process of settling on issues of terminology.

There are of course other challenges, and the following serve as some examples. Not all countries conduct annual drug surveys, possibly due to financial constraints. Countries differ in types of prescription opioids in their pharmacopeias. Some countries allow opioids, primarily codeine combination products, to be sold without a prescription. In addition, countries differ in overall availability of prescription opioids for licit purposes. Such differences may make it difficult to interpret cross-national differences (or similarities) in prevalence rates of nonmedical use of prescription opioids. It would seem that some metric of amount of licit use, such as prescriptions sold or the S-DDD from the INCB,[42] should be factored in as a "denominator," and therefore a ratio of nonmedical use to medical use could be calculated for more valid cross-national comparisons to be made. The importance as well as the complexity of including denominators in analyzing the epidemiology of nonmedical use of prescription opioids has been discussed by others.[12,13,20,33,60,73]

What would be the benefits to add questions on non-medical use of prescription opioids in their national surveys to countries that do not currently do so? Countries would have information not only about the absolute prevalence of nonmedical use of prescription opioids within their borders but also about the prevalence of nonmedical use of prescription opioids relative to that of illicit drugs (eg, heroin, cocaine). It may be that some countries that are not currently assessing prevalence on nonmedical use of prescription opioids have problems of sufficient magnitude that would warrant a change in their national drug control strategies and policies. Perhaps some countries would discover that nonmedical use of prescription opioids is not a significant problem, relative to other drugs of abuse. This would be valuable for them to know, but they could also determine if a problem develops by asking questions every time they administer their survey (ie, trend analyses). This is the phenomenon that occurred in the United States: Nonmedical use of prescription opioids was not "on the radar" in the early 1990s but in the mid-to-late 1990s became a significant problem and remains so to this day. This would also be valuable to monitor especially if the situation in the United States is a harbinger of problems that might occur in other countries, which was the very issue Compton and Volkow[18] raised that prompted our investigation.

If other countries assessed for prevalence of nonmedical use of prescription opioids, then one of the questions of interest that prompted this investigation could be addressed, and was related to an issue raised by Compton and Volkow.[18] In the United States, studies have shown that greater availability of prescription opioids for licit purposes is accompanied by greater nonmedical use of such drugs. Does such a relationship occur in other countries that have relatively high rates of prescription opioid use for medical purposes? One country that has been identified as having high rates of prescription opioid use is Denmark, consistent with its ranking in Table 1.[4,22] If Denmark and other countries with relatively high usage rates of prescription opioids also have high prevalence rates of nonmedical usage, this would be important to know, as it would provide evidence that the relationship of availability for licit purposes to nonmedical

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use is not peculiar to the United States. However, it is possible Denmark may have markedly lower prevalence rates of non-medical usage than the United States. If this is the case, one can then examine what might account for cross-national differences between countries that are experiencing a problem and those that are not, yet have similar consumption rates of prescription opioids for medical purposes. For example, differences in regulation of prescription drugs, availability of different types of prescription opioids, attitudes about their medical use (let alone nonmedical use), availability of other psychotherapeutic drugs and illicit drugs, law enforcement practices, governmental drug regulation, and culture may play a role.[19,37,62,83]

Conclusions

The 2 issues we raised in this Focus Article were prompted in part by comments from others in the field concerned about different facets of nonmedical use of prescription opioids. We sincerely hope that this article will serve as a springboard for discussion and commentary by others from a number of different disciplines and philosophies of similar or differing viewpoints on issues we perceive as important relating to the problem of non-medical use of prescription opioids.

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Table 1

Most Recent National Surveys, as of December 2007, of Illicit Drug Use in the General Population From the 25 Countries With the Highest Consumption Levels of Opioids[43] and Whether and How Nonmedical Use of Prescription Opioids Were Assessed

COUNTRY	OPIOID CONSUMPTION*	YEAR	AGE	SURVEY METHOD	DEFINITION OF USE	CATEGORY RELEVANT TO PRESCRIPTION OPIOIDS	PREVALENCE		
							LIFETIME	PAST YEAR	PAST MONTH
United States[76]	33,532	2006	12+	Computer	Took that were not prescribed to you, or that you took only for the experience or feeling that it caused	Pain relievers (Darvocet-N, Darvon, Tylenol with codeine, Percocet, Percodan, Tylox, Vicodin, Lortab, Lorcet/ Lorcet Plus, codeine, Demerol, Dilaudid, Fioricet, Fiorinal, hydrocodone, methadone, morphine, OxyContin, Phenaphen with codeine, propoxyphene, SK-65, Stadol, Talacen, Talwin, Talwin NX, tramadol, Ultram, and “other”)	13.6	5.1	2.1
						OxyContin	1.7	0.5	0.1
Belgium[54, ‡]	18,698	2004	15–64	Interview, SAQ†	None	None	—	—	—
Canada[1]	14,133	2004	15+	Telephone	None	None	—	—	—
Denmark[55]	13,691	2005	16–44	Interview, SAQ	None	None	—	—	—
Germany[48]	12,972	2003	18–59	Mail	We could not determine	Other opiates: (ex: codeine, opium, morphine)	1.2	0.2	0.1
Switzerland[71, §]	11,981	2002	15–39	We could not determine	We could not determine	Other	—	—	—
Austria[79]	8800	2004	15+	Interview, SAQ	None	None	—	—	—
Luxembourg[29,‖]	8387	1998	15–64	Interview	None	None	—	—	—
Spain[56]	8277	2005	15–64	Interview, SAQ	We could not determine	“Other opiates”	0.5	0.1	0.1
Australia[3]	7494	2004	14+	Telephone and drop-and- collect	Nonmedical defined as: “either alone or with other drugs in order to induce or enhance a drug	Other opiates/ opioids (morphine, pethidine)	~1.0	~0.2	—

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COUNTRY	OPIOID CONSUMPTION*	YEAR	AGE	SURVEY METHOD	DEFINITION OF USE	CATEGORY RELEVANT TO PRESCRIPTION OPIOIDS	PREVALENCE		
							LIFETIME	PAST YEAR	PAST MONTH
					experience; for performance enhancement (eg, athletic enhancement); or for cosmetic purposes (eg, body shaping)"				
						pain-killers/ analgesics (eg, aspirin, paracetamol, mersyndol)	—	—	—
Norway[59]	7314	2004	15–64	Interview, SAQ	None	None	—	—	—
Ireland[53]	6903	2002–2003	15–64	Interview	"Ever taken." Also asked how they were obtained, though results were not published (as of Dec 2007). Choices were: "I got them on a prescription; I got them from someone else I know; I bought them without a prescription in a chemist; None of the above."	"Other opiates" - "opium, Temgesic, buprenorphine, Diconal, (Dike), napps, MSTs, pethidine, DF118 (dihydrocodeine), morphine"	—	—	—
Netherlands[67]	6562	2005	15–64	Multimethod	None	None	—	—	—
New Zealand[81]	6236	2001	15–45	Telephone	"Tried … I am only interested in the times when you used them for recreational purposes."	Other opiates (eg, methadone, pethidine)	1	0.3	0.1
						Morphine (misties)	1	0.2	0.06
Finland[36], ¶	5408	2004	15–69	Mail	We could not determine	Sedatives, tranquilizers, or painkillers for nonmedical purposes	—	—	—
Portugal[5],**	5178	2001	15–64	Interview	We could not determine	None	—	—	—

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COUNTRY	OPIOID CONSUMPTION*	YEAR	AGE	SURVEY METHOD	DEFINITION OF USE	CATEGORY RELEVANT TO PRESCRIPTION OPIOIDS	PREVALENCE		
							LIFETIME	PAST YEAR	PAST MONTH
Sweden[58], ††	5130	2006	16–64	Mail	None	None	—	—	—
Slovenia‡‡	4839								
France[7]	4770	2005	18–64	Telephone	None	None	—	—	—
United Kingdom	4548	England and Wales[68] 2005–2006	16–59	Computer	Have you taken methadone or physeptone (not prescribed by a doctor)?	Methadone	0.1	0.1	0.1
		Northern Ireland[53] 2002–2003	15–64	Interview	"Ever taken." Also asked how they were obtained, though results were not published (as of Dec 2007). Choices were: "I got them on a prescription; I got them from someone else I know; I bought them without a prescription in a chemist; None of the above."	"Other opiates" – "Temegesic, codeine, Kapake, morphine, opium, DF's, diffs, dikes, peach"	—	—	—
Iceland[40], §§	4378	2001	18–75	Mail/Telephone	We could not access survey report	We could not access survey report			
Falkland Islands‡‡	4257								
Israel[6]	3724	2001	18–40	We could not assess	None	None	—	—	—
Malta[47]	2969	2001	18–65	Interview	None	None	—	—	—
Italy[66], ||||	2953	2005	15–64	Mail	None	None	—	—	—

Proprietary terms and manufacturers: Darvocet-N and Darvon (Xanodyne Pharmaceuticals, Inc., Newport, KY); Demerol, Talacen, Talwin, and Talwin NX (Sanofi-Aventis, Bridgewater, NJ); Dilaudid and Vicodin (Abbott Laboratories, Abbott Park, IL); Fiorinal (Watson Pharmaceuticals, Inc., Corona, CA); Kapake (Galen, Ltd., Craigavon, UK); Lortab and Lorcet/Lorcet Plus (Forest Pharmaceuticals, Inc., St. Louis, MO); OxyContin (Purdue Pharma L.P., Stamford, CT); Percocet and Percodan (Endo Pharmaceuticals, Chadds Ford, PA); Phenaphen with codeine (Wyeth-Ayerst Laboratories, Madison, NJ); Stadol (Bristol-Myers Squibb, New York, NY); Temgesic (Reckitt & Colman Pharmaceuticals, Hull, England); Tylenol with codeine, Tylox, and Ultram (Ortho-McNeil Pharmaceuticals, Inc., Raritan, NJ).

* Levels of consumption of narcotic drugs: Average consumption of narcotic drugs, in defined daily doses for statistical purposes per million inhabitants per day, excluding preparations listed in Schedule III, 2003–2005 from the International Narcotics Control Board.[42]

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† SAQ, Self-administered questionnaire.

‡ The report to the EMCDDA stated that in the survey only prevalence of cannabis was assessed. The 2001 survey assessed for cannabis, ecstasy, and amphetamines.

§ In the report, prevalence rates are reported for several illicit drugs as well as for a category of "other," so it is possible that prescription opioids may have been included in that category. However, there was no specific category for prescription opioids.

|| We could not access the survey report, but it is in the reference section. We contacted the "early warning system partner" for Luxembourg (found on the European Monitoring Centre for Drugs and Drug Addiction [EMCDDA] website, http://www.emcdda.europa.eu/index.cfm?fuseaction=public.Content&nnodeid=16784&sLanguageiso=EN), and it was confirmed on September 20, 2007 that nonmedical use of prescription opioids was not assessed in the survey.

¶ We were able to access the original source, but we were unable to translate the article into English. We contacted the "early warning system partner" for Finland, and it was confirmed on September 19, 2007, that nonmedical use of painkillers was assessed but the prevalence data presented in the survey represented nonmedical use of sedatives, tranquilizers, and painkillers. Further, the definition of "painkiller" was not specified in the survey.

** The survey report was available by purchase only. We contacted the "early warning system partner" for Portugal, and it was confirmed on September 26, 2007, that respondents were not queried on nonmedical use of prescription opioids. The survey collected data "on the use of medication without a prescription in general."

†† The report to the EMCDDA stated that in the last 2 national general population surveys, only prevalence of cannabis was assessed.

‡‡ No national drug survey was conducted to our knowledge.

§§ We could not access the survey or report; therefore, we do not know whether prevalence of nonmedical use of prescription opioids was assessed in the survey.

|||| We were able to access the original source, but we were unable to translate the article into English. We contacted the "early warning system partner" for Italy, and it was confirmed on September 21, 2007, that respondents were not queried on nonmedical use of prescription opioids. Questions were asked about "heroin and other opioids," but the drugs were not separated when prevalence of use was estimated.