PAIN® 154 (2013) 708–713

PAIN®

www.elsevier.com/locate/pain

Medical use, medical misuse, and nonmedical use of prescription opioids: Results from a longitudinal study

Sean Esteban McCabe [a,b,*], Brady T. West [c,d], Carol J. Boyd [a,b,e]

[a] Institute for Research on Women and Gender, University of Michigan, Ann Arbor, MI 48109-1290, USA
[b] Substance Abuse Research Center, University of Michigan, Ann Arbor, MI 48109-2054, USA
[c] Center for Statistical Consultation and Research, University of Michigan, Ann Arbor, MI 48109-1070, USA
[d] Survey Research Center, Institute for Social Research, University of Michigan, Ann Arbor, MI 48016-1248, USA
[e] School of Nursing, University of Michigan, Ann Arbor, MI 48109-5482, USA

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article.

ARTICLE INFO

Article history:
Received 2 November 2012
Received in revised form 24 December 2012
Accepted 8 January 2013

Keywords:
Adolescents
Prescription opioids
Medical use
Nonmedical use
Substance abuse
Longitudinal
Epidemiology

ABSTRACT

The objective of this study was to examine the prevalence and patterns associated with past-year medical use, medical misuse, and nonmedical use of prescription opioids (NMUPO) among adolescents over a 2-year time period and to examine substance abuse, sleeping problems, and physical pain symptoms associated with these patterns of medical use, medical misuse, and NMUPO. A Web-based survey was self-administered by a longitudinal sample of 2050 middle and high school students in 2009–2010 (Year 1) and again in 2010–2011 (Year 2). The study was set in 2 southeastern Michigan school districts. The longitudinal sample consisted of 50% females, 67% Whites, 28% African-Americans, and 5% from other racial/ethnic categories. Main outcome measures were past-year medical use, medical misuse, and NMUPO. Of those reporting appropriate medical use of prescription opioids in Year 1, approximately 34% continued medical use in Year 2. Of those reporting past-year NMUPO in Year 1, approximately 25% continued NMUPO in Year 2. Appropriate medical use and NMUPO for pain relief was more prevalent among girls than boys. Multiple logistic regression analyses indicated that the odds of a positive screen for substance abuse in Year 2 were greater for adolescents who reported medical misuse or NMUPO for non-pain-relief motives in Year 1 compared with those who did not use prescription opioids. The findings indicate an increased risk for substance abuse among adolescents who report medical misuse or NMUPO for non-pain-relief motives over time. The findings have important clinical implications for interventions to reduce medical misuse and NMUPO among adolescents.

1. Introduction

There has been an increase in the prescribing of opioids among adolescents and young adults in the United States over the past 2 decades [10,26,29]. Recent research suggests that approximately 4 in every 5 adolescents who were prescribed opioids in the past year used their medications appropriately, while the remaining 20% misused their own medications, which consisted predominantly of "using too much," with fewer reporting "intentionally getting high" [22]. Appropriate medical use of prescription opioids was not associated with an increased risk for substance abuse, whereas medical misuse was associated with an increased risk for substance abuse [22]. Based on the lack of longitudinal research, there is a need to examine the patterns associated with medical use and misuse of prescription opioids over time among adolescents.

The National Survey on Drug Use and Health (NSDUH) indicates that 2 million people aged 12 years or older in the United States initiated nonmedical use of prescription opioids (NMUPO) within the past year [23]. The NSDUH defined NMUPO as the use of prescription pain relievers that were not prescribed for you or that you took for the experience or feeling they caused [23]. The estimated number of emergency department visits involving prescription opioids more than doubled between 2004 and 2008 for patients younger than 21 years of age [24]. Although there have been recent advances in the understanding of prescription opioid use and misuse among adolescents, considerable gaps in knowledge remain due to limitations in measures and study designs. For instance, many existing studies such as the NSDUH often fail to distinguish between (1) individuals who use someone else's prescription opioids one time to relieve physical pain; (2) individuals

* Corresponding author at: Institute for Research on Women and Gender, University of Michigan, 204 S. State St., Ann Arbor, MI 48109-1290, USA. Tel.: +1 734 615 8840; fax: +1 734 615 2931.
E-mail address: plius@umich.edu (S.E. McCabe).

0304-3959/$36.00
http://dx.doi.org/10.1016/j.pain.2013.01.011

who use someone else's prescription opioids daily to get high; (3) individuals who use their own prescription opioids appropriately for the feeling they caused; and (4) those who misuse their own prescription opioids daily to get high. As a result, these individuals are often combined in national estimates of NMUPO. In order to improve existing knowledge and develop more effective intervention efforts, a more nuanced understanding of NMUPO is needed which takes into account motivations for NMUPO and whether an individual has been prescribed opioids and used them appropriately.

For this study, medical use of prescription opioids refers to the appropriate use of these medications prescribed by a doctor, dentist, or nurse. Medical misuse of prescription opioids refers to engaging in behaviors not intended by the prescriber, such as using too much or intentionally getting high. NMUPO refers to the nonprescribed use of these medications. Despite the cross-sectional studies regarding NMUPO and medical misuse of prescription opioids, there remains a lacuna of knowledge regarding the patterns of these risky behaviors over time among adolescents. The aims of this longitudinal study were to assess the prevalence and patterns associated with medical use, medical misuse of prescription opioids, and NMUPO among secondary school students over a 2-year time period, and to examine the substance use behaviors, sleeping problems, and physical pain associated with these patterns.

2. Methods

This study was conducted during a 17-month period between December 2009 and April 2011, drawing on the entire population of middle and high school students attending 2 public school districts in the Detroit metropolitan area. The study received approval from the University of Michigan Institutional Review Board, and a certificate of confidentiality was obtained from the National Institutes of Health. All parents in the school districts were sent letters requesting permission for their children to participate in the Secondary Student Life Survey (SSLS), explaining that participation was voluntary, describing the relevance of the study, and assuring that all responses would be kept confidential. The SSLS was maintained on a hosted secure Internet site running under the secure sockets layer protocol to insure safe transmission of data.

The SSLS was used to collect data at both Year 1 and Year 2. The SSLS assesses demographic characteristics and adolescent problem behaviors (eg, bullying, gambling), and also includes items from several national studies of alcohol and other drug use [13,23]. The Youth Self Report questionnaire (YSR) [1] is a widely used self-report instrument measuring childhood behavioral problems and was embedded in the SSLS to collect data about sleeping problems and physical pain symptoms.

Medical use of prescription opioids was measured using the following question: "The following questions are about the use of prescribed medicines. We are not interested in your use of over-the-counter medicines that can be bought in drug or grocery stores without a prescription, such as aspirin, Sominex®, Benadryl®, Tylenol PM®, cough medicine, etc. On how many occasions in the past 12 months has a doctor, dentist, or nurse prescribed the following types of medicine for you?" A separate question was asked for 6 different classes of prescription medications, including "Prescribed pain medication (eg, opioids such as Vicodin®, OxyContin®, Tylenol 3® with codeine, Percocet®, Darvocet®, morphine, hydrocodone, oxycodone)." The response scale ranged from (1) 0 occasions to (7) 40 or more occasions.

Medical misuse of prescription opioids was assessed by asking about the following behaviors as they relate to prescribed use of opioid medications: (1) "On how many occasions (if any) in the past 12 months have you. . .(a) . . .used too much (eg, higher doses, more frequent doses) of your prescribed medication?" (b) ". . .intentionally gotten high with your prescribed medication or used it to increase other drug or alcohol effects?" The response scale was identical to that for medical use of prescription opioids.

Nonmedical use of prescription opioids (NMUPO) was assessed with the following question: "On how many occasions in the past 12 months have you used the following types of medicines, not prescribed to you? Pain medication (eg, opioids such as Vicodin®, OxyContin®, Tylenol 3® with codeine, Percocet®, Darvocet®, morphine, hydrocodone, oxycodone)." The response scale was identical to that for medical use of prescription opioids.

Motives for NMUPO were assessed by asking students who reported NMUPO to respond to the following statement: "Please provide the reason(s) why you used pain medication not prescribed to you?" Respondents were asked to select all that apply from a list of 9 motives based on previous research (eg, relieve pain, experimentation, get high, help sleep, decrease anxiety, counteract the effects of other drugs, safer than street drugs, addicted, other) [3,12,20,21].

Prescription opioid use behaviors were assessed with the following mutually exclusive 5-category measure based on past-year medical use, medical misuse, and motives for NMUPO: (1) no medical or NMUPO, (2) medical use only, (3) medical misuse only, (4) NMUPO for pain relief only, (5) NMUPO for non-pain-relief.

The Drug Abuse Screening Test, Short Form (DAST-10) is a self-report instrument that can be used in clinical and nonclinical settings to screen for probable drug abuse or dependence on a wide variety of substances other than alcohol [25]. Respondents were asked whether they had experienced 10 drug-related problems in the past 12 months. If a respondent positively endorsed 3 or more DAST-10 items, this was considered a "positive" screening test result, denoting risk for probable drug abuse or dependence [6,11,25]. The DAST-10 has been shown to have good reliability, concurrent validity, and temporal stability, and identifies individuals who need more intensive assessment for substance abuse problems [6,18]. In addition, the DAST-10 was evaluated using *Diagnostic and Statistical Manual of Mental Disorders*, 4th Edition drug use disorder diagnosis as the criterion and found levels of sensitivity and specificity of .70 and .80, respectively, when using a cut point of 3 [17]. Cronbach alpha for the DAST-10 items in the present study for Year 2 was 0.96 (n = 424). Based on the objectives of the present study, we also considered DAST results without the item regarding "non-medical reasons" for drug use, resulting in 9 DAST items. Based on previous research, if a respondent positively endorsed 2 or more DAST-9 items, this was considered a "positive" screening test result [6,11,25]. Cronbach alpha for the DAST-9 items in the present study for Year 2 was 0.96 (n = 424).

The CRAFFT is a brief self-report alcohol and other drug screening test developed specifically for adolescents [15]. "CRAFFT" is a mnemonic based on the 6 yes/no questions. The CRAFFT has acceptable reliability ($\alpha = .79$) and is highly correlated ($r = 0.84$) with the Personal Involvement with Chemicals Scale [15]. A score of 2 or higher on the CRAFFT had sensitivity and specificity of 0.80 and 0.86, respectively, for detecting any substance abuse or dependence; similarly, a score of 2 or higher had sensitivity and specificity of 0.92 and 0.80, respectively, for detecting substance dependence [14].

Sleeping problems were assessed with the following YSR item: "I have trouble sleeping" in the past 6 months. The response scale ranged from (1) not true to (3) very true or often true. Consistent with previous research, sleeping problems were defined as responses of "somewhat or sometimes true" or "very true or often true" [28].

Physical pain symptoms were assessed with the following 3 YSR items: "headache," "stomach aches," or "aches and pains (not