Opioids in Adolescents' Homes: Prevalence, Caregiver Attitudes, and Risk Reduction Opportunities

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Abstract

Objective: The most common source of misused opioids is pain relievers prescribed for family and friends. This study was conducted to assess knowledge, attitudes, and behaviors of adolescents' caregivers regarding prescribed opioids in the home.

Methods: The self-administered survey was completed by caregivers in the waiting rooms of 12 pediatric practices in the Midwest. Eligibility required living in a home where youth age ≥10 years were frequently present. Out of 793 eligible caregivers, 700 (88.3%) completed the survey, 76.8% of whom were the parent.

Results: Among the 700 caregiver respondents, 34.6% reported opioids in the home (13.6% active prescriptions, 12.7% leftover medications, 8.3% both). Of those with an active prescription, 66.0% intended to keep any leftover medications for future needs (for the patient, 60.1%; for someone else, 5.9%). Of those with leftover medications, 60.5% retained them for the same reason (for the patient, 51.0%; for someone else, 9.5%). Others kept medications unintentionally, either because they never got around to disposing of them (30.6%), they did not know how to dispose of them properly (15.7%), or it never occurred to them to dispose of the medications (7.5%). Many caregivers were unaware that adolescents commonly misuse opioids (30.0%) and use them to attempt suicide (52.3%), and that opioid use can lead to heroin addiction (38.6%). According to the surveys, 7.1% would give leftover opioid medications to an adolescent to manage pain and 5.9% might do so.

Conclusions: Opioids are prevalent in homes in our community, and many parents are unaware of the risks they pose. Study findings can inform strategies to educate parents about opioid risk and encourage and facilitate timely, safe disposal of unused medications.

Keywords: opioids; pediatrics; practice-based research network

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What's New

Opioid medications are in one third of adolescents' homes. Many parents and other caregivers are unaware of the risks that opioids in the home pose for adolescents.

Opioids commonly prescribed for pain relief include hydrocodone, oxycodone, tramadol, morphine, and fentanyl, among others. Initially, the use of these addictive drugs was restricted to the management of severe acute pain, postsurgical pain, and end-of-life care. When use was extended to include chronic pain conditions requiring high-dose and long-term prescriptions, prescribing rates quickly quadrupled.[1] In parallel with increased medication availability, opioid use disorders and opioid-related overdoses and deaths have increased.[1-4] Nonmedical use of prescribed opioids increases the risk of heroin use,[5] and increased use of these illicit opioids has markedly increased deaths due to opioid overdose,[3,4,6,7] resulting in what is now considered an opioid overdose epidemic and a national emergency.

Public health efforts to address this urgent public health problem have focused on curtailing opioid prescribing for adults and adolescents, expanding the use of medication-assisted treatment to reduce opioid use disorders and overdose, and better identification of patients at risk.[4,5] Recently there has been an increased focus on research to identify alternative pain medications and public information campaigns.[8] Although the rates of opioid prescribing and of high-dose prescribing have decreased since 2011, the number of prescriptions with a >30-day supply has not changed, and prescribing rates remain threefold higher than in 1999.[1,6]

Opioids prescribed for family members and friends represents the most common source of pain relievers for

misuse, with and without the permission of the persons for whom they were prescribed.[9] Misuse of prescription pain relievers is defined as use in any manner not directed by a doctor, including using drugs without a prescription.[9] The most recently published US data are from 2016, when 11.5 million people ≥12 years of age misused prescribed pain relievers, representing approximately 4% of the population, and there were 42,249 deaths due to opioid overdose.[4,10] Misuse of prescribed opioids is an important problem for adolescents. In 2016, approximately 3.5% of youths age 12 to 17 years (>881,000) misused prescription pain relievers, approximately one half (423,000) doing so for the first time, and 152,000 had a pain reliever use disorder.[9,10] In 2015, 772 opioid overdose deaths occurred in 15- to 19-year-olds.[11]

The ready availability of prescribed opioids is a known risk factor for opioid misuse,[5] yet little is known about the availability of prescribed opioids in homes where youths are present, or why leftover medications are kept. The present study aimed to better understand caregivers' knowledge of and attitudes toward prescribed opioids, the availability of these drugs in the homes where youths are present, and why leftover medications are retained. This information can inform interventions to reduce adolescents' access to leftover opioids and augment efforts to reduce misuse, addiction, poisonings, accidental deaths, and suicides.

METHODS

Between March 15, 2017, and May 30, 2017, we conducted a survey of parents and other caregivers attending community-based pediatric practices. All study sites were members of the Washington University Pediatric and Adolescent Ambulatory Research Consortium (WU PAARC). WU PAARC is a practice-based research network (PBRN) of community pediatricians and pediatric nurse practitioners associated with Washington University. Twelve of 35 WU PAARC−associated practices, all located in the St Louis metropolitan area, agreed to participate. The study was approved by the Washington University Human Research Protection Office, and verbal consent was required for study enrollment.

STUDY POPULATION

Survey participants were parents (including stepparents and legal guardians) or other caregivers who accompanied a child for an appointment and reported they regularly had a youth in their home ≥10 years of age. Caregivers who were not proficient in English, were under age 18, or who had already completed the survey were excluded.

STUDY PROCEDURES

At each site, study participants were recruited during weekdays by 1 of 2 research assistants (RAs). The RA approached individuals in the waiting room to assess their eligibility for the survey, invite them to participate, explain participation requirements, and answer questions. The RA did not approach parents who were immediately called to see the provider, were occupied with an administrative task, were present only to pick up paperwork or a prescription, or were busy talking with another parent or talking on the phone.

To accommodate participant preferences and office workflow, an electronic version on an iPad (Apple, Cupertino, Calif) and a paper version of the survey were used. Both versions were offered, and the participant chose the method. After completion, the participant returned the completed survey to the RA.

SURVEY TOOL

The 23-item self-reporting anonymous questionnaire was developed by the study team, based on the literature and modified following pilot testing with 8 participants. It took between 3 and 5 minutes to complete and had a Flesch−Kincaid reading level of 10.2.

Questions addressed participants' attitudes, beliefs, and behaviors regarding opioid pain medications. Participants reported if they had any prescribed opioid pain medications in their home from an active or old prescription. By selecting from a list, they indicated the type of opioid and what they planned to do or had done with any leftover medications. Using categorical scales, they indicated their likely behavior regarding providing opioid medications to an older child or adolescent for nonmedical use for 2 indications: to control pain and to aid sleep. Response options included "I would do it for severe pain/severe sleeping problem," "I would do it for moderate pain/moderate sleeping problem," "I may do it," and "I would never do it." Participants reported whether opioid pain medications in their home had ever been used by someone other than the person they were prescribed for ("yes," "no," "don't know," "does not apply"). They also indicated how much they agreed with a series of statements ("strongly agree," "agree," "disagree," "strongly disagree," "don't know") about the risk of opioids for addiction, for abuse in adults and in adolescents, for heroin addiction, and for suicide in adolescents. Demographic information was also obtained.

STATISTICAL ANALYSES

Summary statistics are reported as percentages for categorical variables and median (range or interquartile range) for continuous variables. We compared demographic criteria, participant's relationship to the child (parent vs other caregivers), their knowledge about opioids, and their intent to share opioids with an adolescent for pain relief ("would do" and "may do" for severe or moderate pain) between those who did and did not have any opioids at home (combining those reporting medications available from an active and old prescription) using the Pearson chi-square test, Fisher exact test, or Student *t* test for between-group analyses as appropriate. For these analyses, we summarized demographic criteria as follows: racial group (white, black, other), health insurance (Medicaid vs other insurance), family income (>$100,000/year vs less income) and participant's education (bachelor's degree or higher vs less education). For the comparisons

of knowledge about opioids, we combined the responses for the knowledge questions of "strongly agree" and "agree" and of "strongly disagree" and "disagree" and report responses to each knowledge question in 3 categories: "agree," "disagree," and "don't know." We made these choices to summarize the data either because of small cell size (eg, some racial groups, strongly disagree) or to permit comparison with other studies. A probability of $P < .05$ (2-tailed) was used to determine statistical significance. All statistical analyses were performed using Stata 12 (StataCorp, College Station, Tex).

RESULTS

STUDY PARTICIPANTS

The 12 participating WU PAARC practices (11 group practices and 1 solo practitioner) were located throughout the St Louis metropolitan area (10 in Missouri and 2 in Illinois; 11 suburban and 1 rural). Using self-reported data routinely collected to characterize our PBRN, we determined that participating practices did not differ from nonparticipating practices in terms of location, practice arrangement, number of physicians, presence of an electronic medical record, and percentages of patients who were black, had Medicaid insurance, or were of Hispanic ethnicity. An RA was present at each site for a median of 4.0 days (range, 4.0−6.5 days) for study recruitment.

During the time that the RA was present in these 12 offices, 2295 individuals attended for an appointment. Of these, 195 (8.5%) were not approached by the RA, most often because they were immediately called back to see the provider. Of the 2100 who were invited to participate, 1307 (62.2%) were ineligible (1022 with no youth age ≥10 years who was regularly in the home, 34 minors, 6 non-English speaking, 40 with a repeat appointment, and 205 with no appointment, eg, picking up paperwork or a prescription). Of the 793 who were eligible, 93 (11.7%) declined and 700 (88.3%) completed the survey (median, 53.5 surveys per practice; range, 18−105). Of the 700 study participants, 53.5% completed the electronic survey and 46.5% completed the paper survey.

The majority (78.8%) of respondents were the parent (mother, 66.7%; father, 12.1%) of the child attending the appointment, 76.6% lived in 2-parent homes, and 39.1% had not graduated from college (Table 1). Twenty percent were black, and 26.0% used Medicaid insurance for the child.

Table 1. Characteristics of Survey Respondents (n = 700)

Characteristic	Value
Relationship to child, % (n)	
Mother	66.7 (467)
Father	12.1 (85)
Grandparent	6.4 (45)
Sibling	5.1 (36)
Other relative	7.9 (55)
Other	0.71 (5)
Missing	1.0 (7)
Age (y), median (IQR)	40.0 (35−47)
Racial group, % (n)	
White	73.7 (516)
Black	20.3 (142)
Other	4.9 (34)
Missing	1.1 (8)
Hispanic or Latino, % (n)	
Yes	2.9 (20)
No	96.4 (675)
Missing	0.7 (5)
Education level, % (n)	
High school, no diploma	2.3 (16)
High school graduate or GED	15.1 (106)
College, no degree	21.7 (152)
Associate's degree or equivalent	14.7(103)
Bachelor's degree	27.3 (191)
Graduate or professional degree	17.1 (120)
Missing	1.7 (12)
Family type, % (n)	
Two-parent family	76.6 (536)
One-parent family	19.3 (135)
Other	3.6 (25)
Missing	0.6 (4)
Annual family income ($), % (n)	
<30,000	20.1 (141)
30,001 to <60,000	16.6 (116)
60,001 to <70,000	10.0 (70)
70,001 to <100,000	15.0 (105)
≥100,001	33.0 (231)
Missing	5.3 (37)
Health insurance, % (n)	
Work-related insurance	54.6 (382)
Medicaid	26.0 (182)
Private insurance	13.0 (91)
Other	2.7 (19)
Missing	3.7 (26)
Area of residence, % (n)	
Urban, inner city	9.4 (66)
Urban, not inner city	15.4 (108)
Suburban	54.4 (381)
Rural	18.6 (130)
Missing	2.1 (15)
State of residence, % (n)	
Missouri	80.6 (564)
Illinois	18.4 (129)
Missing	1.0 (7)

IQR indicates interquartile range; GED, general education diploma.

CAREGIVER'S KNOWLEDGE OF AND ATTITUDE TOWARD OPIOID RISKS

Caregivers' responses to the opioid knowledge questions are presented in Table 2. The majority of respondents agreed that opioids are a common drug of abuse among adults (87.3%) and adolescents (69.2%), and that they are addictive (86.2%). Fewer agreed that opioid use can lead to heroin addiction (61.0%) or that opioids are commonly used in suicide attempts by adolescents (46.9%).

If leftover opioids were available to them, 7.1% of respondents indicated that they would use them to provide pain relief for an adolescent (6.4% for severe pain, 0.7% for moderate pain), and 5.9% indicated they might do so to control pain. Fewer would use them for an adolescent with sleeping difficulties (0.9% for a severe sleeping problem, 0% for a moderate sleeping problem), and 1.0% might do

Table 2. Adolescents' Caregivers' Knowledge About Opioids (n = 700)

Belief	Strongly Agree, % (n)	Agree, % (n)	Disagree, % (n)	Strongly Disagree, % (n)	Don't Know, % (n)	Missing, % (n)
Opioids are addictive	53.6 (375)	32.6 (228)	3.3 (23)	0.9 (6)	9.0 (63)	0.7 (5)
Opioids are a common drug of abuse in adults	52.3 (366)	35.0 (245)	2.0 (14)	0.4 (3)	9.6 (67)	0.7 (5)
Opioids are a common drug of abuse in adolescents	33.6 (235)	35.6 (249)	4.0 (23)	0.7 (5)	25.3 (177)	0.9 (6)
Use of opioids can lead to heroin addiction	34.1 (239)	26.9 (188)	2.9 (20)	0.7 (5)	35.0 (245)	0.4 (3)
Opioids are commonly used in suicide attempts by adolescents	19.3 (135)	27.6 (193)	3.1 (22)	0.6 (4)	48.6 (340)	0.9 (6)

so. Fourteen percent (101) of all respondents indicated that opioids had ever been misused in their home (denied use, 77.7%; not applicable, 4.1%; don't know, 3.1%).

Prevalence of Opioids in the Home

Twenty-two percent (153 of 700) of respondents had medications from an active opioid prescription at home, and 21.0% (147 of 700) had opioid medications at home left over from a previous prescription. More than one half (57.8%) of the leftover medications had been prescribed within the past year, 28.6% had been prescribed 1 to 3 years earlier, and 12.2% had been prescribed more than 3 years earlier. The most common opioids reported were hydrocodone (57.5% of active prescriptions and 49.7% of leftover medications), oxycodone (30.1% of active prescriptions and 37.4% of leftover medications), and codeine (20.9% of active prescriptions and 29.9% of leftover medications). A total of 242 (34.6%) survey respondents had opioids at home (95 [13.6%] with active prescription only, 89 [12.7%] with leftover medications only, and 58 [8.3%] with both).

Reasons to Keep Leftover Opioids

Sixty-six percent of respondents who reported an active prescription intended to keep any leftover medications in case of future need (60.1% by the patient and 5.9% by someone else), whereas 26.1% reported planning to dispose of any leftover medications immediately. Of those who had leftover medications in the home, 61.0% reported that this was deliberate, most often in case they were needed in the future (51.0% by the patient and 9.5% by someone else). Respondents also kept medications because a lot were leftover (11.6%) or because the drugs were expensive and they did not want to waste them (10.2%). Others reported that retention was more unintentional; they never got around to getting rid of leftover medications (30.6%), they wanted to get rid of them but did not know how to do so (15.7%), or it never occurred to them to get rid of them (7.5%). (Percentages sum to more than 100% because multiple responses were allowed.)

Risk Factors for the Presence of Opioids in the Home

Risk factors for the presence of opioids in the home identified in the univariate analyses (combined active prescription and leftover old prescription) are presented in Table 3. Factors that increased the likelihood of opioids in the home were a higher family income and higher caregiver education. Opioids were less common if the caregiver lived in a rural area. Data are not shown, but the prevalence of opioids in the home did not vary by respondent's relationship to the youth, race, household type, or use of Medicaid insurance. In addition, prevalence did not vary by respondents' knowledge of the risks associated with opioid use or their intention to share opioids with adolescents for pain.

Table 3. Risk Factors for the Presence of Opioid Medications in the Home

Characteristic	Opioids Present	No Opioids Present	*P* Value
Income (n = 663), %			
>$100,000/year	40.7	59.3	.02
Less income	31.9	68.1	
Caregiver education (n = 688), %			
Bachelor's degree or higher	41.2	58.8	.001
Less education	29.2	70.8	
Area of residency (n = 685), %			
Rural	23.9	76.2	.02
Suburban	37.3	62.7	
Urban	37.4	62.6	

DISCUSSION

Opioids prescribed for family members and friends are the most common source of misuse.[9] Findings from this large, community-based study suggest that opioids are in plentiful supply in the community, and that there is an urgent need to address this problem. Prescribed opioids were present in 1 in 3 homes in the study sample, a robust estimate that is consistent with previous smaller studies.[12,13] Although we did not assess storage of these medications, other studies suggest that safe storage is uncommon and that youths' unsupervised access to opioids in the home is widespread.[14,15] Also concerning was the finding that 1 in 10 caregivers would be willing to share leftover opioids with adolescents for pain management. These findings suggest an urgent need for education for caregivers about the risks to their children of easy access to opioid medications prescribed for someone else.

Our findings suggest that many caregivers do not understand the risks associated with misuse of prescribed opioids. One half of survey respondents were unaware that opioids are commonly used in adolescent suicide, and more than one third did not know about the risk of progression to heroin use,[5] yet prescribed opioids and heroin are most often used by teenagers who attempt suicide by overdose.[16,17] After marijuana, prescribed pain relievers are the most common drug of initiation for illicit drug use,[18] and nonmedical use of prescribed opioids is a strong risk factor for heroin use.[5,19] This lack of understanding regarding the risks associated with misuse of prescribed opioids is worrisome and may underlie the absence of caregivers' concern about keeping leftover opioids in the home.[20] Indeed, in our study, 14% of caregivers were aware of opioid misuse in their home. In addition, the risk perception of occasional narcotic use is low in adolescents.[21] In a 2016 survey, fewer high school students rated occasional use of opioids as "very risky" than chose this rating for smoking 1 to 5 cigarettes per day,[22] and adolescents may view prescription opioids as safer than illicit drugs.[21] Education is needed to change the attitudes of adolescents and their caregivers toward misuse of prescribed opioids.[23]

Our study findings can inform a campaign to reduce access to opioids in the home. We learned that some caregivers kept leftover opioid medications unintentionally, either because they had not gotten around to disposing of them or were unaware of how to do so safely. Others kept the medications deliberately in case of future need by the patient for whom they were prescribed or by others. Pediatricians and other primary care providers could identify those at risk by inquiring about prescribed opioids in the home, for example, when prescribed for wisdom tooth extraction or for another family member. Providers could encourage the storage of active prescriptions in a locked container and strongly recommend that parents avoid sharing prescribed medications and remove all leftover medications from the home.[24] A provider recommendation to dispose of leftover medications and a discussion regarding how to do so is associated with increased medication disposal,[25] although we found no prospective studies to evaluate this approach. Providers also could educate parents and adolescents about the risks of opioid misuse and encourage parents to discuss these risks with their children. Our finding that opioids are more commonly found in homes of families with higher socioeconomic status suggests that such a campaign is relevant and needed for all families.

Currently, reliable information about safe disposal is difficult to access. Often, it is not provided when the drugs are dispensed,[26] and there is conflicting information from government sources available on the Internet. The US Food and Drug Administration suggests flushing opioids for immediate human safety or throwing them in the garbage after packaging them with used coffee grounds or kitty litter in a sealed container so they cannot be reused.[27,28] However, there are concerns that opioids in the water supply may harm fish, wildlife, and humans.[28] To avoid environmental contamination, a preferred option is to use designated safe disposal sites. Providers can refer parents to a Drug Enforcement Agency website to identify local safe disposal sites and mail-back collectors.[29] A more convenient option might be to dispense specially designed medication disposal bags with every opioid prescription,[29] a strategy recently deployed by Walmart.[30] Parents and other caregivers need access to a disposal process that is effective, easy, and safe.

Our study is the first large, community-based survey to assess the availability of prescribed opioids in the homes of parents and other caregivers who live in homes frequented by youths, and our response rate was high. In our sample of 700 caregivers, our estimate that one third of households contain at least 1 opioid prescription is robust and similar to other, smaller studies.[12,13] Nonetheless, several limitations of this study should be noted. Participants were English-speaking caregivers recruited at pediatric practices in a metropolitan area in the midwestern United States, and this convenience sample might not be representative of all caregivers from our PBRN or from other locations. Indeed, misuse of prescribed pain medications among 12- to 17-year-olds is higher in Missouri than national estimates.[31] Also, data were self-reported and not verified and thus may be subject to recall bias. However, potential inaccuracies may have been mitigated by the anonymous and self-administered nature of the questionnaire.

CONCLUSIONS

Our findings suggest that parents and other caregivers need education regarding the risks of opioids in children and adolescents, along with encouragement to dispose of unused medications and access to a safe disposal system. Although they are not common prescribers of opioids, pediatricians could help counteract the threat that opioid medications pose for children and adolescents by asking about prescribed opioids in the home, educating about the

risks posed by these drugs, and recommending and facilitating timely and safe disposal of unused medications. Research is needed to develop and evaluate such primary care–based interventions.

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