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OPIOIDS, SUBSTANCE ABUSE & ADDICTIONS SECTION

Original Research Articles

Under Treatment of Pain: A Prescription for Opioid Misuse Among the Elderly?

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Correction made after online publication July 10, 2013: author names have been updated.

Abstract

Objective. To examine the demographic, physical, and mental health characteristics; current drug use patterns; motivations for use; and diversion sources among elderly prescription opioid misusers.

Design. Mixed methods design.

Setting. Research field offices, or senior or community center offices in South Florida.

Subjects. Individuals aged 60 and over reporting past 90-day prescription medication misuse; only prescription opioid misusers (N = 88) were included in the final analysis.

Methods. The Global Appraisal of Individual Needs was the main survey instrument. A subsample of elderly reporting substantial prescription drug misuse were chosen for the in-depth interview (N = 30).

Results. The mean age was 63.3. Fifty percent reported ever being admitted to a drug treatment program; several endorsed recent illicit drug use: powder cocaine and/or crack (35.2%), marijuana (30.7%), heroin (14.8%). The majority reported past year severe physical pain and discomfort (86.4%), and misuse of their primary opioid for pain (80.7%); over half (52.3%) obtained their primary opioid from their regular doctor. Qualitative data highlight the misuse of prescription opioids due to untreated or undertreated pain. Participants with primary opioid misuse for pain had over 12 times higher odds of obtaining the medication from their regular doctor (odds ratio [OR] = 12.22, P = 0.002) and had lower odds of using a dealer (OR = 0.20, P = 0.005).

Conclusions. Findings suggest that this group of elderly participants often misuse their own prescriptions for pain management. This study highlights the need to educate prescribing professionals on appropriate pain management for older adults while still being sensitive to issues of substance abuse and dependence.

Key Words. Older Adults; Pain Management; Substance Abuse; Opioids

Introduction

Chronic, noncancer pain is often associated with increasing age [1,2]. Findings from the National Health and Nutrition Examination Survey indicated that 57% of individuals 65 and over reported noncancer pain that lasted 1 year or more [3]. Another community-based survey documented that 35.7% of individuals aged 60–69 experienced pain throughout the day [2]. Although it has been estimated that 45–85% of elderly persons in various settings experience chronic, noncancer pain, less than half are effectively treated by their general practitioners [4]. Research on individuals 18 and over found that more than one third of patients continued to be unsatisfied with the treatment offered for their chronic pain condition [1], and for the elderly specifically, it has been reported that over 40% experienced daily pain with only one quarter receiving any analgesic [5]. The undertreatment of noncancer pain in older adults has been attributed to both provider and patient factors [6]. At the provider level, there is inadequate screening and identification [7], and a lack of training in treating pain [6]; contributors to the undertreatment

of pain at the patient level include underreporting, cognitive decline, and attitudes regarding pain as part of the aging process [6,8].

Reports of national survey data indicate that in recent years, prescription opioid misuse has been on the rise [9]. Prescription opioid misuse has also been associated with increased prescription drug diversion (the unlawful channeling of regulated pharmaceuticals from legal sources to the illicit marketplace) through the illegal sale and recycling of prescriptions by physicians and pharmacists; "doctor shopping" by individuals who visit numerous physicians to obtain multiple prescriptions; theft, forgery, or alteration of prescriptions by patients; robberies and thefts from manufacturers, distributors, and pharmacies; street buys; and sharing with friends [10,11]. Research has indicated that the therapeutic exposure to opioids can correspond to increases in misuse [12]. The fear of abuse or the development of addiction among patients, coupled with scrutiny from regulatory agencies such as the Drug Enforcement Administration (DEA) are barriers that often result in the failure to adequately treat pain symptoms [13–15]. Although chronic pain has been documented by some as a factor associated with prescription drug misuse [16] or a common reason for the nonmedical use of prescription pain medications [17,18], few studies focus on the misuse of prescription pain medications among older adults outside of drug treatment settings. Moreover, little is known about the specific motivations for prescription opioid misuse and diversion among the elderly.

Although substance abuse is rarely associated with individuals nearing or at a retirement age [19,20], there is an increasing need to understand the nature and extent of drug use among older adult populations. With the baby boomer population (those born between 1946 and 1964) beginning to reach their 50s and 60s, 10,000 people will turn 65 everyday and continue to do so for the next 20 years; by 2030, one out of every five Americans will be 65 or older [21]. This population increase, coupled with greater lifetime drug use than previous generations [22], will likely produce unprecedented high numbers of older adult drug users [23–30].

When looking at recent survey data for older adults, the Substance Abuse and Mental Health Services Administration [24] reported that 4.7% of adults over 50 had used an illicit drug in the past year, with marijuana being the most commonly used (2.8%) followed by the nonmedical use of prescription medications (2.1%). Among adults over 65, nonmedical use of prescription-type drugs was most common (0.8%).

Given these increases, there will undoubtedly be an increased call for drug treatment programs tailored to the ever-changing needs of elderly patients [23,30]. Some estimates have documented up to a 70% increase in the rate of treatment need among older adults [25]. When examining existing findings, Lowfall et al. [30] reported a significant growth in substance abuse treatment admissions for older adults between 1992 and 2005; in 2005,

10% of all admissions were age 50 and over. Results showed a growing proportion of older aged admissions for polysubstance and illicit drug abuse, particularly cocaine and heroin abuse. Moreover, data taken from the Treatment Episode Data Set (TEDS) [31,32] indicated some notable increases among the primary substances of abuse for adults 60 and over: sedative as primary drug jumped from 1.7% in 2002 to 5.2% in 2007; heroin went from 0.9% in 2002 to 1.5% in 2007; smoked cocaine doubled from 0.5% in 2002 to 1% in 2007; and opiate abuse remained stable across this time period. These data indicate an increasing trend of illicit drug and sedative abuse among this aging population.

Most recent research on older adult populations has originated from cross-sectional national survey data [17,19,23,25,28,32,33]. While several publications have projected substance use disorder among older adults (50 and older) and baby boomers [23,25,26,33], or discussed substance abuse-related treatment needs specific to this population [26,27,34–36], few studies have specifically examined the characteristics, sources, and motivations for prescription drug misuse among those over the age of 60 [17,24,37,38]. Furthermore, little is known about the misuse of prescription opioids for untreated pain among older adult populations.

In order to focus on this distinct and understudied population, we examined data from individuals aged 60 and over who had recently misused prescription medications. The unique nature of the present study is that it specifically targeted elderly outside of treatment settings. This article examines demographic, physical, and mental health characteristics, and current drug use patterns and sources among elderly prescription opioid misusers in South Florida. We also report results from qualitative interviews that explored motivations and other factors associated with prescription opioid misuse.

Methods

Participants

The South Florida Health Survey, a 4-year mixed methods study funded by the National Institute on Drug Abuse, examined prescription drug misuse and diversion among six subpopulations in South Florida. Eligible participants were 18 years of age or older, and reported misuse of psychoactive prescription drugs (opioids, stimulants, sedatives, antidepressants, or antipsychotics) at least five times in the past 90 days. For the purposes of the study, prescription drug misuse was defined as either using medication without a doctor's prescription or using more of a medication than prescribed. In screening for the study, we did not assess specifically for substance dependence, typically characterized by cravings, compulsion to use, inability to control use, and continued use despite negative consequences [39]. Participants were also required to meet one of the following criteria that determined the subpopulation they represented: 1) *methadone* clients (N = 301); 2) *street drug*

users (N = 301) who reported current illicit drug use; 3) *public treatment clients* (N = 300) and 4) *private-treatment clients* (N = 301), both of which were enrolled in drug treatment for fewer than 45 days prior to the interview; 5) *men who have sex with men* (MSM; N = 301) who reported current illicit stimulant use; and 6) *elderly aged 60 and above* (N = 126). This report only includes elderly participants who reported prescription opioid misuse in the past 90 days (N = 88).

Measures

Prior research has documented that those most likely to progress from opioid misuse to abuse are often in pain, with many possessing comorbid medical and psychiatric conditions [40]. Moreover, for substance abusers in treatment, increased age was found to be associated with debilitating pain, deteriorating mental health, and the use of medical channels as the primary source for opioids [37]. These findings informed the selection of the demographic, and physical and mental health factors utilized for this analysis. The Global Appraisal of Individual Needs (GAIN) [41] was the primary data collection instrument for the survey study. Psychometric studies have found Cronbach's alphas between 0.9 and 0.8; specifically, for the General Mental Distress Scale (GMDS), the Substance Dependence Scale, and the Health Distress Scale (HDS), Cronbach's alphas are at 0.8, and behavior questions have demonstrated test-retest correlations over 0.8 [42]. The GAIN has eight core sections including: demographics; mental and physical health; human immunodeficiency virus (HIV) risk behaviors; environmental, legal, and vocational measures; and substance use, abuse, and dependence measures based on Diagnostic and Statistical Manual of Mental Disorders IV (DSM-IV) criteria. Questions were added to the GAIN to increase the specificity of prescription drugs queried, including both opioids (fentanyl, hydrocodone, hydromorphone, immediate release [IR] and extended release [ER] oxycodone, morphine, methadone, and codeine) as well as benzodiazepines (alprazolam, diazepam, and clonazepam). The assessment instrument captured a complete illicit and non-medical prescription drug history, including number of days use in the past 90 days.

The primary opioid misused in the past 90 days was determined from the database using the number of days; in cases of ties, the number of pills ingested in the past 90 days was used to determine primary opioid. The primary opioid diversion source used by each respondent in the past 90 days was determined from the database; participants may have endorsed using more than one source. In order to assess the motivations for past 90-day primary opioid misuse, participants were asked: "What is your main reason for using this drug?" (pain, anxiety or stress, get high, to substitute for another drug, to moderate other drug effects, to sleep, social pressure, and others); respondents may have reported more than one motivation for each endorsed drug.

Participants were also asked what method they used to obtain each diverted prescription drug they misused in the past 90 days. Diversion methods included script doctors, doctor shopping, regular doctor, pharmacist, theft, dealer, sharing and trading, family members, transport from another country, or Internet purchase; response choices were dichotomous (yes/no).

Mental distress was measured by the GMDS, which includes depression (e.g., feeling sad, lonely, or hopeless; feeling tired or having no energy) and anxiety (e.g., feeling nervous, anxious, or tense; unable to control worries) experienced in the past 12 months; response choices were dichotomous (yes/no). For the purpose of this analysis, endorsement of six or more out of nine depressive symptoms was categorized as severe depression, and seven or more anxiety symptoms out of 12 was categorized as severe anxiety. In order to assess DSM-IV dependence, respondents were asked seven questions to assess dependence symptoms for each drug used (response choices were: never, more than a year ago, 7–12 months ago, 4–6 months ago, 1–3 months ago, 1–4 weeks ago, or I don't know); endorsement of three or more of these symptoms in the past year from the following seven categories constituted DSM-IV dependence: tolerance, withdrawal, use in larger amounts, inability to cut down, great effort to obtain the drug, reduction or problems related to important activities resulting from use, and continued use despite physical and psychological problems.

Respondent demographic characteristics including age, gender, and race/ethnicity (African American/Caribbean, Hispanic/Latino, White, Other) were reported. Respondents were asked, "In the past 12 months would you say your health was: excellent, very good, good, fair, or poor?" and "when was the last time you experienced health or medical problems?" (never, more than 12 months ago, 4–12 months ago, in the past 90 days). Those endorsing past 90-day health or medical problems were asked, "What is the problem you have been having?" The response to this question was recorded verbatim. To measure pain, an item from GAIN's HDS was selected: "During the past 12 months, have you had a lot of physical pain or discomfort?" In addition, participants were asked whether they had any health insurance in the past 90 days, whether they had been homeless in the past year, whether they had ever been admitted to drug treatment, and whether they had sold any prescription medication in the last 90 days; these response choices were dichotomous (yes/no).

A subsample of elderly who reported substantial prescription drug misuse and multiple diversion methods were chosen from the quantitative study for the in-depth interview (N = 30). The in-depth interviews were designed to gather qualitative data regarding prescription drug abuse initiation, motivations for prescription drug misuse, drug abuse patterns, and prescription drug diversion sources. The interview guide included

questions such as: How did you start abusing prescription drugs?; What were the main reasons?; What are the current reasons for abusing prescription drugs?; What are the different ways you obtain these drugs?; and How does prescription drug abuse affect your health? The goal of the qualitative component of the study was to gather more detailed information about drug use history, diversion sources, and motivations for use. All in-depth interviews were transcribed verbatim for analysis.

Procedures

Study recruitment procedures have been described previously [43,44]. Elderly recruitment was conducted through a variety of purposive sampling strategies including print media advertisements, the posting or manual distribution of cards and flyers, chain referrals with incentives, and presentations at senior centers, the Broward County Department of Veteran Affairs outpatient clinic, and community health centers. As a result of specific recruitment challenges, such as reluctance to participate in telephone screening or to discuss personal information, 126 elderly participants were ultimately recruited.

The study was conducted in the investigators' research field offices or in senior or community center offices in Broward, Lee, Miami-Dade and Palm Beach Counties. All participants were screened for eligibility by trained research staff prior to participation in a single, standardized face-to-face interview. Following informed consent, computer-assisted or in-depth interviews were conducted in private offices and lasted between 1 and 2 hours. Participants received a $30 monetary stipend for their time. All study protocols and instruments were approved by the University of Delaware (predecessor institution) and Nova Southeastern University Institutional Review Boards.

Analyses

Data were analyzed using IBM SPSS Statistics, version 20 (International Business Machines Corp., Raleigh, NC, USA). Descriptive statistics were calculated to describe the sample in terms of demographics, physical and mental health status, substance use, DSM-IV past year dependence, recent (past 90 day) primary opioid of abuse and recent (past 90 day) primary opioid diversion source. Primary opioids included codeine, hydrocodone, hydromorphone, morphine, fentanyl, methadone, IR and ER oxycodone, and tramadol; the benzodiazepine group included alprazolam, clonazepam, and diazepam. Bivariate logistic regression models were constructed to predict diversion source for primary opioid by demographics, physical and mental health characteristics, and recent illicit drug and opioid use. Significance level was set at $P < 0.05$ for all comparisons.

The primary author conducted multiple readings and coding of all in-depth interview transcripts to identify salient themes. Although guided by the quantitative findings, there were no predetermined categories used to code the data.

A grounded theory approach was selected for the data analysis because it allows for the participant explanations to inform or explain the phenomenon or social process [45].

For the purpose of this manuscript, a content analysis of the 30 interviews was conducted to ascertain motivations for prescription opioid misuse. Initial coding was performed through a thorough word-by-word reading of the transcripts to identify the current reasons for using prescription opioids. After this initial coding was conducted, more focused coding was used to identify the most frequently occurring themes, including the misuse of medications to manage pain. Finally, the major concepts and categories were conceptualized, and each one was assigned the quotes that best illustrated them.

Results

Demographics

Sample characteristics are displayed in Table 1. The mean age of the sample was 63.3 (standard deviation [SD] 4.6; range 60–84; 86.4% of the sample was age 60–65); the sample was predominately male (75%). The racial/ethnic makeup of the sample represents the broad diversity of South Florida's population: 36.4% were African American/Caribbean; 37.5% were White; 20.5% were Hispanic/Latino; and 5.6% endorsed "other race/ethnicity." Less than half had more than a high school education (42%). The majority of participants had health insurance (73.9%). Less than half (46.6%) of the respondents had an income over $1,000 per month; 61.4% had disability or social security as their income source. More than one quarter (28.4%) reported being homeless in the past 90 days. Over two thirds (77.3%) had ever been arrested, and 50% had ever been admitted to drug treatment. Nearly one quarter (23.7%) of the sample reported being a veteran. A small percentage of the sample (10.2%) reported having sold prescription medication in the past 90 days.

When examining physical and mental health, 70.4% reported fair or poor health in the past year, and the vast majority endorsed past year severe physical pain and discomfort (86.4%). Out of the 88 participants, 67 (75%) reported past 90-day health or medical problems; of these, 36.4% (N = 24) reported back- or disc-related pain, followed by arthritis pain by 25.8% (N = 17), and various other pain conditions. Past year severe depression was reported by 44.3% of the sample, while severe anxiety was reported by 28.4%. In terms of motivations for primary opioid misuse, 80.7% (N = 71) endorsed misusing their primary opioid for pain, distantly followed by 14.8% (N = 13) reporting misuse to get high, and 14.8% (N = 13) "to substitute for another drug."

Recent (Past 90-Day Drug Abuse)

Table 1 shows the drugs of abuse/misuse in the past 90 days for the sample: alcohol (63.6%), benzodiazepines (48.9%), powder cocaine and/or crack (35.2%), marijuana (30.7%), heroin (14.8%), prescription antidepressants

Table 1 Characteristics of elderly prescription opioid abusers in South Florida (N = 88)

Demographics	N	%
Age (mean, SD)	63.3 (4.6)	
Male gender	66	75
Ethnicity		
African American/Caribbean	32	36.4
White	33	37.5
Hispanic	18	20.5
Other	5	5.6
Ever arrested	68	77.3
Income over $1,000 per month	41	46.6
Income source: disability or social security	54	61.4
Homeless in past 90 days	25	28.4
Ever admitted to drug treatment	44	50.0
Education: more than HS	37	42.0
Veteran	21	23.7
Sold medication in the past 90 days	9	10.2
Physical health		
Health insurance	65	73.9
Medicare/medicaid	49	55.7
Private insurance	4	4.5
Past year health—fair or poor	62	70.4
Recent (past 90 days) physical problems	66	75.0
Past year severe physical pain or discomfort	76	86.4
Recent (past 90 days) primary opioid misuse for pain	71	80.7
Mental health		
DSM-IV past year dependence	13	14.8
Severe depression in the past 12 months	39	44.3
Severe anxiety in the past 12 months	25	28.4
Past 90-day drug use		
Alcohol	56	63.6
Marijuana	27	30.7
Heroin	13	14.8
Cocaine or crack	31	35.2
Opioids	88	100.0
Benzodiazepines	43	48.9
Prescription antidepressants	9	10.2
Prescription antipsychotics	12	13.6
Past 90-day primary opioid		
IR or ER oxycodone	34	38.6
Tramadol	18	20.5
Hydrocodone	14	15.9
Recent primary opioid diversion source		
Regular doctor	46	52.3
Dealer	26	29.5
Sharing	26	29.5
Family	7	8.0
Script doctor	2	2.3
Pharmacy	1	1.1

ER = extended release; HS = high school; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV; IR = immediate release; SD = standard deviation.

(10.2%), and prescription antipsychotics (13.6%). The primary opioids of abuse were oxycodone (38.6%), followed by tramadol (20.5%) and hydrocodone (15.9%). DSM-IV criteria for substance dependence in the past year were met by 14.8% of respondents.

Recent Primary Opioid Diversion Source

Sources of diversion for prescription medications varied among respondents. Regular doctor was the most popular source among respondents (52.3%), followed by dealer (29.5%), sharing and trading (29.5%), family (8%), script doctor (2.3%), and pharmacy (1.1%).

Table 2 shows the odds ratios (ORs) for diversion source. Whites, Hispanics, and those endorsing "other" ethnicity had significantly lower odds of obtaining their primary opioid from their regular doctor as compared with the African American/Caribbean reference group. Individuals who had ever been arrested had nearly five times higher odds of obtaining their primary opioid from a dealer (OR = 4.91, P = 0.043); individuals with disability or social security as an income source had significantly lower odds of using a dealer (OR = 0.26, P = 0.005), whereas those who endorsed being homeless in the past 90 days had over three times higher odds of having a dealer as their source (OR = 3.23, P = 0.020). Veterans had nearly four times higher odds of acquiring their primary opioid via a regular doctor (OR = 3.95, P = 0.016) and were also significantly less likely to obtain medication through sharing or trading with others (OR = 0.19, P = 0.034).

Certain physical health characteristics were also significantly associated with primary opioid diversion source. Respondents with health insurance had over three times higher odds of using a regular doctor (OR = 3.43, P = 0.018) and had lower odds of using either a dealer (OR = 0.33, P = 0.029) or sharing (OR = 0.25, P = 0.007). Participants endorsing recent physical problems had lower odds of using a dealer (OR = 0.22, P = 0.004), while those who endorsed recent primary opioid misuse for pain had over 12 times higher odds of using a regular doctor to obtain their primary opioid (OR = 12.22, P = 0.002) and had significantly lower odds of using a dealer (OR = 0.20, P = 0.005). None of the mental health variables were significant.

Recent illicit drug use had several associations to primary opioid diversion source. Alcohol users had over four times higher odds of using a dealer (OR = 4.53, P = 0.012) and over three times higher odds of obtaining medication via sharing (OR = 3.24, P = 0.036). Marijuana users had over four times higher odds of using a dealer (OR = 4.40, P = 0.003) and lower odds of using a regular doctor (OR = 0.32, P = 0.020). Although heroin, cocaine or crack, and benzodiazepine users were all less likely to use a regular doctor to acquire their primary opioid, benzodiazepine users had over four times higher odds of using a dealer (OR = 4.30, P = 0.005). When examining primary opioid misuse by source, IR or ER oxycodone misusers had higher odds of using a dealer (OR = 2.85, P = 0.030) but lower odds of obtaining primary opioid through their regular doctor (OR = 0.31, P = 0.012). Tramadol misusers had over 10 times higher odds of obtaining their opioid through a regular doctor (OR = 10.76, P = 0.003) but had lower odds of acquiring them through a dealer (OR = 0.11, P = 0.034).

Qualitative Data

Out of the 30 qualitative respondents, 10 were veterans, 20 had illicit drug use histories, and 15 were misusing their own prescriptions. The primary theme that emerged in the qualitative analysis was opioid misuse to achieve pain relief; in this regard, 10 individuals specifically discussed the need to take more medication because the amount prescribed was not enough to manage their pain. Other less common themes included: misusing opioid medication to avoid drug withdrawal, misuse of opioid medication to sleep, and misuse of opioid medications to manage symptoms of anxiety or depression.

This analysis highlights the findings on the misuse of prescription opioids due to untreated or undertreated pain. Three main themes emerged: 1) the misuse of legitimately prescribed medications to manage pain; 2) reluctance of physicians to prescribe high dose/potency pain medications; and 3) participant need to purchase pain medication from other sources due to lack of legitimate prescriptions or insurance.

Misuse of Legitimate Prescriptions

Several participants misused their own legitimately prescribed medications for pain management. As one 61-year-old male described:

> Sometimes man I'll take more than they prescribe a day, just in order to get through the pain man . . . One extra a day.

A 64-year-old male described:

> The prescription on the Percocet is one every 4 hours. If the pain doesn't go away I might drop another one before the four hours is over with. It all depends on the pain level . . . It's only when the pain is intense that I may (go over the prescribed amount) . . . Maybe 4 times in a month I do that.

Similarly, a 65-year-old male veteran explained:

> Tramadol. I am supposed to take three a day, sometimes the pain is so bad that I take 5 . . .

As a result of misusing their own medications, some participants described having to buy medication on the street or from other sources because they ran out of their own prescription before it was time to have it refilled.

According to a 61-year-old disabled male veteran:

> They give me a prescription with 90 pills in it. That is for 3 months . . . Half of the month, the first month, I be down there tellin them I need some

Table 2 Bivariate logistic regressions predicting sources of diverted primary opioid diversion source (odds ratio [95% CI] P value)

Demographics	Regular doctor		Dealer		Sharing	
Male gender*	1.44 (0.55–3.80)	P = 0.461	2.25 (0.68–7.50)	P = 0.185	0.66 (0.24–1.80)	P = 0.420
Ethnicity†						
African American/Caribbean (ref)						
White	0.21 (0.06–0.73)	P = 0.014	1.79 (0.49–6.48)	P = 0.378	2.17 (0.58–8.10)	P = 0.252
Hispanic	0.25 (0.09–0.71)	P = 0.009	1.79 (0.59–5.40)	P = 0.305	2.82 (0.91–8.70)	P = 0.072
Other	0.08 (0.01–0.86)	P = 0.037	2.38 (0.33–17.17)	P = 0.389	1.08 (0.10–11.52)	P = 0.947
Ever arrested‡	0.87 (0.32–2.36)	P = 0.781	4.91 (1.05–22.97)	P = 0.043	1.34 (0.43–4.17)	P = 0.613
Income over $1,000 per month‡	0.92 (0.40–2.14)	P = 0.853	0.78 (0.31–1.97)	P = 0.602	0.50 (0.19–1.28)	P = 0.148
Income source: disability or social security‡	1.17 (0.72–4.10)	P = 0.226	0.26 (0.10–0.67)	P = 0.005	0.41 (0.16–1.04)	P = 0.061
Homeless in past 90 days‡	0.79 (0.31–2.00)	P = 0.614	3.23 (1.21–8.64)	P = 0.020	0.90 (0.32–2.51)	P = 0.841
Ever admitted to drug treatment‡	1.73 (0.75–4.03)	P = 0.202	1.55 (0.62–3.91)	P = 0.351	0.41 (0.16–1.06)	P = 0.065
Education: more than HS‡	0.33 (0.33–1.82)	P = 0.562	0.39 (0.15–1.07)	P = 0.067	0.64 (0.25–1.66)	P = 0.362
Veteran‡	3.95 (1.30–12.02)	P = 0.016	0.48 (0.15–1.60)	P = 0.233	0.19 (0.04–0.88)	P = 0.034
Physical health						
Health insurance‡	3.43 (1.24–9.48)	P = 0.018	0.33 (0.12–0.89)	P = 0.029	0.25 (0.09–0.69)	P = 0.007
Medicare/medicaid‡	1.12 (0.48–2.60)	P = 0.792	0.71 (0.28–1.81)	P = 0.475	0.71 (0.28–1.81)	P = 0.475
Past year health—fair or poor‡	1.77 (0.70–4.46)	P = 0.228	0.56 (0.21–1.47)	P = 0.238	1.20 (0.43–3.33)	P = 0.727
Recent (past 90 days) physical problems‡	1.84 (0.69–4.91)	P = 0.221	0.22 (0.08–0.63)	P = 0.004	0.87 (0.31–2.50)	P = 0.787
Recent (past 90 days) primary opioid misuse for pain	12.22 (2.59–57.66)	P = 0.002	0.20 (0.07–0.62)	P = 0.005	1.01 (0.32–3.22)	P = 0.989
Mental Health						
DSM-IV past year dependence‡	0.75 (0.23–2.44)	P = 0.633	2.36 (0.71–7.86)	P = 0.163	0.68 (0.17–2.70)	P = 0.581
Severe depression in the past 12 months‡	0.64 (0.28–1.50)	P = 0.306	2.16 (0.85–5.48)	P = 0.105	1.73 (0.69–4.35)	P = 0.246
Severe anxiety in the past 12 months‡	0.79 (0.31–2.00)	P = 0.614	2.51 (0.94–6.70)	P = 0.065	0.90 (0.32–2.51)	P = 0.841
Past 90-day drug use						
Alcohol‡	0.52 (0.21–1.26)	P = 0.149	4.53 (1.40–14.40)	P = 0.012	3.24 (1.08–9.70)	P = 0.036
Marijuana‡	0.32 (0.13–0.84)	P = 0.020	4.40 (1.64–11.77)	P = 0.003	0.77 (0.28–2.14)	P = 0.621
Heroin‡	0.22 (0.06–0.88)	P = 0.032	2.36 (0.71–7.86)	P = 0.163	2.36 (0.71–7.86)	P = 0.163
Cocaine or crack‡	0.35 (0.14–0.86)	P = 0.022	1.94 (0.76–4.97)	P = 0.168	1.54 (0.60–3.95)	P = 0.369
Benzodiazepines‡	0.13 (0.05–0.32)	P = 0.000	4.30 (1.57–11.75)	P = 0.005	1.66 (0.66–4.18)	P = 0.285
Prescription antipsychotics‡	0.90 (0.27–3.04)	P = 0.865	0.77 (0.19–3.10)	P = 0.711	0.77 (0.19–3.10)	P = 0.711
Past 90-day primary opioid						
IR or ER oxycodone‡	0.31 (0.13–0.78)	P = 0.012	2.85 (1.11–7.35)	P = 0.030	1.43 (0.56–3.66)	P = 0.454
Tramadol‡	10.67 (2.30–49.97)	P = 0.003	0.11 (0.01–0.84)	P = 0.034	0.62 (0.18–2.11)	P = 0.448
Hydrocodone‡	1.8 (0.55–5.88)	P = 0.331	0.95 (0.27–3.34)	P = 0.931	1.40 (0.42–4.68)	P = 0.582

* Reference group is female.
† Reference group is African American/Caribbean.
‡ Reference group is no.
CI = confidence interval; ER = extended release; HS = high school; DSM-IV = Diagnostic and Statistical Manual of Mental Disorders IV; IR = immediate release.

more pills. And they be like, nah we cant give you no more. So I go out and buy em'. Oxycodone for my knees and stuff like that . . . These pills (his prescription) I take at least 5 of these at one time. I take 5 of each, so I take 15 pills at one time (tramadol, acetaminophen, and cyclobenzaprine). Sometimes if I have some oxycodone I'll take 2 of them. On top of that . . . Sometimes the pills wear off and the pain come back and I take some more . . . The prescription that they gave me, the amount that they tell me to take, just don't do nothin. So I take more than what they tell me to take.

One 64-year-old male explained:

Sometimes go out, if I am in a lot of pain, you know, like I get from like a friend. You know, I'm out of my pain medicine and my back and stuff be buggin me . . . So that's why they was givin me the medication, my back. it all depends on how I was feelin. If the pain is real real bad I double up. I might mix. If my doctor give me another prescription I mix them all up to get rid of the pain. I be in pain . . .

A 61-year-old male veteran:

Sometimes I take some pills, my niece, she have uh spinal problem, a lower spinal problem. And she has uh I don't know if you ever heard of it, oxycodone, yeah now that works . . . little blue pill. I get like 12 from her and I give her like $10.00 . . .

Physician Reluctance to Prescribe High Dose/Potency Opioids

Some participants stated that their physician was reluctant to prescribe large doses of pain medication. A 61-year-old woman described:

Because I didn't want to get hooked like most people, you know, cause I wasn't taking em' for that reason. To get high and that. I was taking them because I was in pain, and my doctor had told me the reason he didn't want to give them to me was because he didn't want me to get hooked. And I always keep things like that in my mind. So that's why I cut back.

A 61-year-old male veteran explained:

For my pain. Not to abuse them, not cause they get me high. Sometimes the medicine wears off before it's supposed to. It is supposed to last a certain amount of time but it don't. Other medicine I guess, I don't know what the reason is. I even told the doctor. He said you have to suffer through the pain. Yeah, right.

Some respondents also described the prescribing of low-dose medications. One 64-year-old male explained:

One time they be prescribing ibuprofen and you know, that one ain't doin no, ain't killin no pain. I might have to take a whole bottle and still be in pain.

Lack of Legitimate Prescriptions or Insurance

Some respondents endorsed getting needed pain medications from other sources due to lack of legitimate prescriptions. According to a 60-year-old male:

I had 8 Percocet I got from a guy I know, you know, for pain. And believe me those percs stop the pain. They are powerful . . . For anybody that got pain that cures it. It's really some good stuff for pain.

One 60-year-old homeless male described buying pills on the street because he has no insurance:

. . . As the days go by the knee gets worse and worse now and using relatively, well a strong pain killer just because now I have to walk everywhere, there is an abnormal amount of stress on the knee because sometimes you are sleeping on a sidewalk, not necessarily sleeping on a bed . . . .Pain. For pain. When you're out on the streets and you are trying to get a job you just, you can't be weak. So to speak. You can't have any maladies that slow you down. You gotta be on top of your game. Especially, and I'm 60 so it's quite harder to get a job than it is somebody 28, 29. I gotta be in that field. If somebody says you know, you gotta be at an interview I gotta be either prepared to walk to it or whatever because I don't have a car . . . See I don't need this stuff . . . I am just at a particular point where right now it has to be done. I have to take it until I have to get my knee repaired.

Discussion

These results reflect a marginalized group of elderly individuals, many with substance abuse histories, that are being undertreated for their pain. For our sample, the majority had health insurance, allowing ease of access to doctors for visits and for medications via pharmacy benefits; this perhaps made obtaining prescriptions more economically feasible for this indigent population. Our findings relating to regular doctor as the primary source of prescription opioids is consistent with prior national studies of individuals in treatment for opioid abuse [38]. For aging treatment populations specifically, Cicero et al. found that respondents over the age of 45 had much higher odds of using a doctor as their source for prescription opioids, suggesting that perhaps it is easier for aging patients with pain to get a doctor's prescription [37].

Although patients have access to medications through physicians, it appears that they are often prescribed lower potency medications, making under treatment of pain a significant issue. The qualitative analysis complements the quantitative data in its illustration of the misuse of prescribed medications for untreated or undertreated pain. Prior research findings have indicated that the elderly may be in a position to deceive physicians by complaining of pain in order to get the prescriptions they desire [46]; our findings suggest that prescription opioid medications may be under prescribed to legitimate patients (in terms of number and potency), causing individuals to take more than indicated to achieve adequate pain relief. Qualitative findings support the idea that doctors seem to be cautious about the types of medications prescribed. Very few participants were prescribed higher potency opioids such as oxycodone, which could likely be due to recent local crackdowns on physicians prescribing pain medications [47] or a concern that patients may develop dependence on prescription opioids [16]. Respondents had over 10 times

higher odds of obtaining tramadol from their regular doctor but were less likely to use a dealer, which further supports the idea that doctors are wary of prescribing scheduled medications possibly due to legal concerns related to abuse, misuse, diversion, or fear of investigation by law enforcement [14].

Our findings also support previous findings that with increasing age, individuals with substance abuse histories are likely to have increased pain and other serious medical issues associated with long-term substance abuse [37]. Many respondents in the sample reported extensive drug use histories and recently used illicit drugs such as marijuana, heroin, or cocaine or crack, increasing the likelihood that individuals from this sample are being treated for medical complications associated with substance abuse. Although substance abuse is clearly on the rise among older adult populations [19], our sample encompasses individuals who likely possess more severe substance abuse involvement and associated life problems than the average older adult. Despite this, there remains an important need to research the continued use of illicit drugs and their effects on the aging brain [23]; moreover, it will be essential to integrate drug treatment modalities that encompass medical as well as behavioral health services [24]. In terms of mental health, our findings that over 40% of our sample reported past year severe depression and nearly 30% experienced severe anxiety are also consistent with prior research documenting that depression or other types of psychological distress are often associated with chronic pain [48].

There are several limitations to this study. First, we have a rather small sample size (N = 88), with the majority being under the age of 70. This group of elderly individuals living within the community has unique characteristics including illicit drug use histories. This makes it difficult to generalize our results to other senior populations. The study also relies on the use of self-report data that are subject to reporting and social desirability bias and recall problems. This research is also based on cross-sectional data, which does not allow for the examination of changes over time. Because the original study was not designed to assess clinical aspects of chronic pain conditions, specific information regarding the origins and other types of treatments to manage pain were not collected. Those in the sample who were prescribed and were regularly taking opioids for pain may have also developed some level of tolerance and physical dependence, creating a difficulty in truly assessing DSM-IV dependence.

Conclusions

Despite these limitations, our findings suggest that this group of elderly participants often misuse their own prescriptions for pain. With prescription opioid misuse on the rise, there is an ongoing need to understand the factors involved in opioid misuse, particularly among older populations in order to combat addiction and prescription drug diversion. Moreover, these findings have implications when considering the treatment of pain in elderly. Our data

highlight the need for continued education and training for physicians and others prescribing pain medications to older populations. In order to ensure the proper prescribing of prescription drugs while being sensitive to diversion and misuse, there is a continued need to educate prescribing professionals on substance abuse identification (including screening for risk factors and identifying the warning signs of drug addiction), as well as to implement screening questionnaires at routine checkups [49]. Among patients with an increased risk for misuse, including those who are younger in age, have current, past, or family history of substance abuse or concurrent psychiatric disorders, it has been suggested that prescribing physicians utilize treatment contracts, structured prescribing, and urine testing [39]. This will facilitate the process of prescribing appropriately, while at the same time aiding in the identification of substance abuse or dependence so treatment referrals can be made for older adults in need.

It has also been recommended that physicians take steps to combat misuse through: working with their patients prior to prescribing these medications in order to clearly define the therapeutic goals; and to discuss the risks and benefits associated with long-term opioid therapy. Furthermore, the ongoing reassessment of these goals at follow-up appointments through discussions of adverse effects and safe and responsible use have also been indicated [6,8]. Screening tools and medication agreements are also valuable tools to use with those being prescribed opioids as part of ongoing pain management [36].

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