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# Factors Associated with Prescription Opioid Misuse in Adults Aged 50 or Older

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## Abstract

**Background—**Although prescription opioid misuse in older adults results in serious health complications, this issue has been overlooked.

**Purpose—**This study aimed to describe the prevalence of prescription opioid misuse and identify factors associated with misuse in adults aged 50 or above.

**Methods—**This study used a cross-sectional design with a convenient sample. One hundred and thirty patients with chronic pain aged 50 or above, taking prescription opioids participated in the study.

**Results—**Approximately 35% of the participants misused their prescription opioids. Factors associated with opioid misuse included age (younger), level of education (higher), level of depression (moderate level), alcohol use problem, illicit drug use, and a higher level of pain interference on walking ability and normal walk. Significant predictors of opioid misuse included education, illicit drug use, depression, and pain interference with normal work.

**Conclusions—**Our study provided important information to health care providers about identifying high-risk older adults.

### Keywords

Prescription opioid misuse; chronic pain; older adults; risk factor; depression

## Introduction

Prescription opioid misuse is a major public health concern. Opioids are one of the most commonly prescribed medications to treat individuals with chronic non-malignant pain (Chou, 2010; Kaye, Jones, Kaye, Ripoll, Galan, Beakley et al, 2017; White, Arnold, Norvell, Ecker, & Fehlings, 2011). However, many patients with chronic pain who are prescribed opioids do not adhere to their medication regimen and engage in behaviors reflecting misuse

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(e.g., taking more than prescribed) and/or abuse (use resulting in significant social, occupational, or health problems) (Chang & Compton, 2013; Larance, Degenhardt, Lintzeris, Winstock, & Mattick, 2011). Research showed that the prevalence of prescription opioid misuse or abuse in individuals with chronic pain ranged from 20% to 32% across health settings (Sullivan, Edlund, Fan, Devries, Brennan, & Martin, 2010; Vowles, McEntee, Julnes, Frohe, Ney, & van der Goes., 2015). Boscarino and colleagues (2010) used a survey approach and Diagnostic and Statistical Manual of Mental Disorders, 4th ed. (DSM-IV) criteria with 705 patients with chronic pain receiving chronic opioid therapy in primary care and pain specialty treatment clinics and found that 26% of those reported a current opioid use disorder and 36% had a lifetime opioid use disorder. Costs associated with prescription opioid misuse and abuse represent a substantial and growing economic burden for society. Total US societal costs of prescription opioid abuse were estimated at $55.7 billion in 2007, with health care costs accounting for $25.0 billion (45%) (Birnbaum, et al., 2011). The increasing prevalence of prescription opioid misuse and abuse suggests that there will be an even greater societal burden in the future (Birnbaum, et al., 2011).

Most studies investigating prescription opioid misuse have focused on adolescents, young, or middle-aged adults. For example, risk factors for opioid abuse, misuse, and other aberrant drug-related behaviors in patients with chronic pain receiving prescription opioids include a prior history of alcohol and illicit drug pain-related functional limitations, current cigarette smoking, a family history of substance abuse, a history of a mood disorder (e.g., current depression), history of child sexual abuse or child neglect, involvement in the legal system, and significant psychosocial stressors (Ives et al., 2006; Jamison & Edwards, 2013; Liebschutz et al., 2010; Morley, Ferris, Winstock, & Lynskey, 2017; Sehgal, Manchikanti, & Smith, 2012; Turk, Swanson, & Gatchel, 2008; Wasan et al., 2007). Although researchers have begun to investigate this issue in older adults with chronic non-malignant pain, only a few studies reported the scope and correlates of prescription opioid misuse in this population. A study conducted in South Florida found that approximately 34% reported substantial prescription opioid misuse (Levi-Minzi, Surratt, Kurtz & Buttram, 2013). Lavin and Park (2010) found that a higher level of pain intensity, a higher level of depression, and a lower level of physical disability were associated with increased opioid misuse in older adults. In 2012, 2.9 million Americans aged 50 or older reported non-medical use of prescription drugs (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). As the Baby-Boomer generation ages and more patients are prescribed opioids, the number of individuals evidencing prescription opioid misuse and abuse is likely to become even greater.

## Impact of Prescription Opioid Misuse in Older adults

The aging process and its effects on body composition make the elderly more pharmacologically sensitive to medications. Age (>55) was found to be a risk factor for opioid-induced respiratory depression (Jarzyna, Jungquist, Pasero, Willens, Nisbet, Oakes et al., 2011). Furthermore, inappropriate use of opioids (misuse or abuse) can lead to addiction and may cause accidents, mood changes, and cognitive decline (Ballantyne, 2012; Culberson & Ziska, 2008; Mailis-Gagnon et al., 2012), as well as overdose and death (Centers for Disease Control and Prevention [CDC], 2016). Among adults aged 50 or older who visited

the Emergency Department for prescription drug toxicity, pain relievers were most commonly involved (43.5 percent), with opioid pain relievers being the most frequent type (SAMHSA, 2010), suggesting that there are high rates of opioid misuse in this population. Furthermore, in 1993, adults aged 25–44 years had the highest rate of hospital inpatient stays involving opioid overuse (188.6 stays per 100,000 population) when compared with other adult age groups. However, between 1993 and 2012, the average annual increase in the rate of hospital stays involving opioid overuse, including opioid dependence, abuse, poisoning, and adverse effects, was lowest among adults aged 25–44 years (2.7 percent) and highest for adults aged 45 years and older (8.9 to 9.1 percent average annual percent change).

Older adults are at high risk for complications related to prescription drug misuse and abuse. Inappropriate use of prescription opioids can cause accidents, as well as mood and cognitive alterations (Simoni-Wastila & Yang, 2006). Moreover, consuming several drugs increases the risk of both drug interactions and adverse reactions, especially in older adults, because chronic illnesses and organ dysfunction alters pharmacokinetics (Finkelstein, Prabhu, & Chen, 2007; Simoni-Wastila & Yang, 2006). Prescription opioid misuse is likely to become an even greater problem as the Baby-Boomer generation ages. Yet existing evidence provides limited knowledge regarding the scope of prescription opioid misuse and its risk factors among older adults. Therefore, there is a need to better understand the scope of prescription opioid misuse and risk factors of their abuse. This study aimed to describe prescription opioid misuse and to identify factors influencing opioid misuse in adults aged 50 or above.

## Methods

This study used a cross-sectional design with a convenience sample. Eligibility criteria included adults who were 50 or above, prescribed opioids for their chronic non-malignant pain (pain lasts than 6 months or longer), and had intact cognitive function as measured by the Mini–Mental Status Examination (MMSE > 23). Participants were recruited from two primary care offices, a pain management clinic, senior apartments, and senior centers located in Western New York. Study flyers, which invited older adults to call the research staff, if they were interested in participation or if they had any questions about the study, were posted on the bulletin boards in the aforementioned locations. Next, the research staff conducted interviews to collect data in a private room at the location. The study was approved by the University Institutional Review Board. Participants completed the questionnaire once. It took about 40 minutes to one hour for the participants to complete the questionnaire. A twenty–dollar gift card was given to the participants upon the completion of the questionnaire. Descriptive statistics were used to describe participant demographic characteristics. We used a two-step statistical analysis method to examine factors associated with prescription opioid misuse. First, chi-square tests were used to compare demographic characteristics, depression, anxiety, alcohol use, illicit drug use, pain intensity, and pain interferences between participants with and without prescription opioid misuse. The significant variables in the first step were further selected for the second step of logistic regression analysis to examine their association with prescription opioid misuse. The odds ratio (OR) and 95% confidence interval (CI) were used to indicate significance. Power

analysis calculations indicate that for multiple logistic regression of a binary dependent at 80% power, a 0.05 significance level, and a multiple correlation coefficient of 0.4 to detect an odds ratio of 1.8 to 2.0, requires a sample size of 123 to 97 (Hsieh, Block, & Larsen, 1998).

## Measures

**Mini Mental State Examination (MMSE)—**The MMSE was developed by Folstein et al. (1975) as a bedside test detecting both delirium and dementia with good test-retest and inter-rater reliability ($r > .80$) and desirable criterion validity (sensitivity = 0.87, specificity = 0.82). The items cover orientation, registration, and the ability to name and follow instructions. The MMSE was utilized as a global cognitive performance measure. A score greater than 23 indicates functional cognition.

**Timeline Follow Back (TLFB)—**The TLFB is a semi-structured interview that uses a calendar format to record the quantity and frequency of substance use over a stated period of time (Sobell & Sobell, 1992; Sobell, Sobell, Leo, & Cancilla 1988). In this study, prescription opioid use was recorded for the 30 days preceding the interview. In using the TLFB, the interviewer starts backward from the interview day asking the older adult to recall on each of preceding days whether a prescription opioid was used as prescribed. Holidays, weekends, and special events can be used as memory cues. The older adults were encouraged to recall as many as they could. The TLFB has been shown to have high test-retest reliability across multiple populations (Skinner & Sheu, 1982; Sobell & Sobell, 1992; Sobell et al., 1988) and desirable agreement with collateral report TLFB (Carey & Simons, 2000). In this study, prescription opioid misuse was defined as on any day in the calendar, participants took more of their opioids than the prescribed dose without communicating with their providers. This definition was chosen because older adults are susceptible to adverse medical outcomes from prescription drug misuse due to age-related physiologic changes in body composition and drug metabolism. Furthermore, older adults have a more complex medication regimen because of other co-existing chronic conditions. Any increased opioid dose without proper adjustment by the provider can potentially cause harm.

**The Brief Pain Inventory short form—**The BPI-SF is a self-report scale consisting of two major concepts: an individual's pain intensity and an individual's level of pain interference. Pain intensity is constructed by four items, including pain at its *worst, least, average*, and *now* (current pain). Pain interference is conceptualized as the degree to which pain interferes with seven daily activity domains, including: relations with others, life enjoyment, mood, sleep, walking, general activity, and working (Cleeland, 1989). The BPI-SF has been widely used across many studies with different populations with the results indicating good reliability and validity (Cleeland, 1989; Cleeland & Ryan, 1994). Higher scores indicate greater pain intensity and greater pain interference. The pain intensity is rated from 0 (no pain) to 10 (worst pain), with 1 to 4 representing mild pain, 5 to 7 representing moderate pain, and 8 to 10 representing severe pain. (Serlin, Mendoza, Nakamura, Edwards, & Cleeland, 1995). The pain interference is rated in the same way, with 0 representing "does not interfere" and 10 indicating, "completely interfere."

**Geriatric Depression Scale (GDS)—**The GDS was developed specifically for screening depression in the elderly and has been extensively tested against other measures across various settings (Yesavage et al., 1983; Brink, Yesavage, Lum, Heersema, Adey, & Rose, 1982; Lach, Chang, & Edwards, 2010). The 30-item long form of the GDS was used in this study. Each item is scored as either 0 (No) or 1 (Yes). A composite score is used to determine the severity of depression: a score of 9 or lower is normal; a score between 10 and 19 indicates mild depression; and a score of 20 to 30 indicates severe depression.

**Hamilton Anxiety Rating Scale (HAM-A)—**The HAM-A consists of 14 items designed to assess the severity of a person's anxiety (Hamilton, 1959). Each item includes a group of symptoms related to anxiety. Each group of symptoms is rated on a five-point scale of zero to four, with four being the most severe. A composite score is used to indicate a person's anxiety severity (Vaccarino, Evans, Sills, & Kalali, 2008): a score of 17 or less indicates mild anxiety severity; a score from 18 to 24 indicates mild to moderate anxiety severity; and a score of 25 to 30 indicates moderate to severe anxiety severity (Vaccarino, Evans, Sills, & Kalali, 2008). HAM-A has been widely used in clinical settings and has demonstrated desirable reliability and validity (Maier, Buller, Philipp, & Heuser, 1988).

**Alcohol Use Disorder Identification Test (AUDIT)—**The AUDIT (Bohn et al., 1995; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993) is a 10-tem instrument designed to identify drinkers at risk for alcohol abuse or dependence. Internal consistency estimates have ranged from 0.75 to 0.94 in a variety of populations (Allen, Litten, Fertig, & Babor, 1997; Dawe, Seinen, Kavanagh, 2000). A score of 8 or higher indicates hazardous drinking (Saunders, et al, 1993).

Demographic characteristics. The data collected included age, gender, race/ethnicity, education, living situation, and illicit drug use in the past year (Yes/No).

## Findings

A total of 130 participants were included in this study. The participants' demographic characteristics are summarized in Table 1. Our participants consisted of 71 females (54.6%) and 59 males (45.4%). The majority of the participants were Caucasian (50%) and African American (39.2%) with a mean age of 60.5, ranging from 50 to 92. The majority of the participants had musculoskeletal pain in the spine (77.7%) or had pain at more than one site (83.8%). About 11.5% of them (n=15) reported illicit drug use in the past year (all used marijuana and 5 of them also used cocaine). Approximately 35% of the participants reported prescription opioid misuse in the past 30 days. Specifically, the average number of days that participants reported taking more opioids was 6, ranging from 4 to 16 days in the past 30 days. The results of comparing demographic and other related variables between participants with and without prescription opioid abuse are presented in Table 2. The results of Chi-square tests indicated that age, education, depression, alcohol use, illicit drug use, pain interference with walking, and pain interference with normal work were significantly associated with prescription opioid abuse. Age was strongly associated with opioid misuse (p= .045). The result showed that with those 65+ in age, the risk of opioid misuse decreases significantly. In other words, participants aged 50–64 had a significantly greater risk of

opioid misuse when compared to those aged 65 or above. Similarly, participants with a higher level of education (p= .043), depression (p= .021), and more pain interferences on walking (p= .020) and normal work (p= .001) were more likely to misuse their prescription opioid. Whether or not the individual suffers from anxiety was not significantly associated with opioid misuse. Alcohol use problem (p= .031) and illicit drug use (p=.000) in the past year were also significantly associated with prescription opioid misuse. Those significant factors were then selected into the logistic regression analysis.

The results of logistic regression examining risk factors of prescription opioid misuse are summarized in Table 3. Coefficients are estimated under the structure that each factor within reference is coded as 0 and others coded as 1, controlling other demographic variables. P-value corresponds to the alternative hypothesis of true odds ratio is not equal to 1. The overall logistic regression model is significant (Wald test = 10.778; p=.001). Our data indicated that age was not a significant predictor of opioid misuse. Although older age reduced a person's likelihood of engaging in opioid misuse, the odds was not statistically significant. Education level, on the contrary, played an important role in predicting opioid misuse. The odds of developing opioid abuse was approximately 2.5 times higher (p=.046) for individuals with higher education status (some college or above) than the odds for people who did not go to college. Although alcohol use problem increased the chance of prescription opioid misuse, the odds was not statistically significant. However, individuals who used illicit drug were more likely to misuse their prescription opioids. The odds of developing prescription opioid misuse were 12.75 times greater for illicit drug users than those who did not use illicit drugs. Individuals with a GDS score ranging from 10 to 19 (moderate depression) were significantly more likely to develop opioid misuse than those with mild or severe depression. The odds of developing opioid misuse is 5.7 times (p=.002) higher for individuals with moderate depression than the odds for a mildly depressed individual. Furthermore, pain interference on walking ability did not significantly predict opioid misuse. However, pain interference on normal work was a significant predictor of prescription opioid misuse (OR=6.438, p = .020). Participants reporting higher levels of pain interference on normal work (e.g., doing housework) were more likely to misuse their prescription opioids.

## Discussion

Our study showed that about 35% of our participants misused their prescription opioids in the past 30 days. Such a prevalence rate is similar to the general chronic pain population (Ives et al., 2006) and geriatric population (Levi-Minzi, Surratt, Kurtz & Buttram, 2013). Our findings showed that patients with chronic pain aged 50 to 64 were more likely to misuse their prescription opioids compared to their older counterparts. This finding is consistent with previous studies indicating that younger age is a risk factor for opioid misuse (Ives et al., 2006; Boscarino et al., 2010). Our younger study participants, aged 50 to 64, reflected the age range of the boomer generation in the United States. In fact, more than 40% of our participants in this age group reported prescription opioid misuse, which was slightly higher than the general chronic pain population (Ives et al., 2006; Boscarino et al., 2010). This finding provides important information indicating that the boomer generation has an increased risk of opioid misuse. It is important to note, however, the criteria and

screening tools for defining prescription opioid misuse in previous studies varied so our findings also need to be interpreted with cautions. Interestingly, our finding indicated that participants with a college degree were more likely to misuse their prescription opioids than those with a high school education. Previous studies have not found any association between education level and prescription opioid misuse. More research is needed to better understand the potential mechanism of such an association.

Depression is a significant risk factor of prescription opioid misuse in our sample. Although this finding is similar to the findings of previous research evidence (Boscarino et al., 2010; Lavin & Park, 2010), our findings specifically identified that patients with a moderate level of depression are at a greater risk for prescription opioid misuse than those with mild or severe depression. It is possible that depressed patients take additional opioids to cope with their non-pain symptoms (Grattan, Sullivan, Saunders, Campbell, & Von Korff, 2012). Alternatively, depressed patients might perceive their pain as more severe, which might prompt opioid misuse (Breivik, 2005). However, patients who experienced severe depression might have different ways of handling their depression other than using more opioids. More research is needed to identify the underlying mechanisms in the association between different depression levels and prescription opioid misuse. Anxiety, on the contrary, was not found to be a significant risk factor. Furthermore, our participants' pain intensity did not significantly predict their opioid misuse. Consistent with many previous studies, pain intensity has not been found to be a strong predictor of current prescription opioid abuse in patients with chronic pain, regardless of age (Jamison & Edwards, 2013; Sehgal, Manchikanti, & Smith, 2012). Despite this, our participants who reported a higher level of pain interference on walking ability and normal walk were more likely to misuse their prescription opioid. Research has indicated pain-related disability or interference was a significant factor of prescription misuse (Jamison & Edwards, 2013; Sehgal, Manchikanti, & Smith, 2012). Chronic pain negatively impacts an individuals' mental health, can cause social isolation, and reduce the quality of life (Gormsen, Rosenberg, Bach, & Jensen, 2010; Gustorff, Dorner, Likar, Grisold, Lawrence, Schwarz et al, 2008; Otto, Bach, Jensen, & Sindrup, 2007). It is possible that our study participants take more opioids than prescribed to treat their chronic pain related interference or cope with their emotional distress to maintain their functionality. These findings indicated that psychosocial adjustment related to chronic pain is an important aspect when treating patients with chronic pain, and interventions addressing mental health might be helpful to prevent prescription opioid misuse (Chang, Compton, Almeter, & Fox, 2015).

Approximately 28% of our participants reported the current use of alcohol. Alcohol use was significantly associated with prescription opioid misuse but was not a risk factor for prescription opioid misuse. Alcohol use while receiving prescription opioids might place individuals at risk for drug-substance interactions, which might lead to severe adverse events such as respiratory depression and death (CDC, 2014). Such adverse effects are more concerning in the older adult population because of the changes in their body composition and drug metabolism (Kinirons & O'Mahony, 2004; Simoni-Wastila & Yang, 2006). It is important for clinicians to also screen for alcohol use in older adults who are taking prescription opioids. Illicit drug use was a strong significant predictor of prescription opioid

misuse. This finding is consistent with previous studies in general chronic pain populations (Ives et al., 2006; Jamison & Edwards, 2013).

There are several limitations in our study. A history of psychiatric problems or substance abuse is associated with prescription opioid misuse. Future studies should include information regarding the personal history of psychiatric illness and substance use. A cross-sectional design cannot ensure the causality in the associations among the variables and convenience sampling reduces the generalizability of the findings of this study. A larger sample size would be helpful to identify potential mediators in the association between predictors and prescription opioid misuse. Furthermore, a larger sample size would allow the ability to classify prescription opioid misuse into different levels of severity. Nonetheless, the results for prescription opioid misuse alone demonstrate a significant concern for health care providers, and reinforces the importance of risk identification in this population.

## Conclusion

Our study found that the prevalence of opioid misuse in older adults with chronic pain is similar to the general population. Some similar risk factors for prescription opioid misuse were found in this population, yet different risk factors were also identified. These included education and pain interference on various functional aspects, which warrant further investigation. Although prescription opioid misuse in older adults results in serious health complications, this issue has been overlooked. Understanding how older adults take their prescription opioids will increase the awareness of drug abuse among older adults, caregivers, and health care providers, as well as help to better identify and treat the elderly drug abuser. Our study provided a preliminary yet important understanding of prescription opioid misuse among older adults and provides important information to health care providers about identifying high-risk older adults.

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## Highlights

- Although prescription opioid misuse in older adults results in serious health complications, this issue has been overlooked. The boomer generation has an increased risk of opioid misuse.
- Understanding how older adults take their prescription opioids will increase the awareness of drug abuse among older adults, caregivers, and health care providers, as well as help to better identify and treat the elderly drug abuser.

**Table1**

Demographic Characteristics of Patients Sample (N=130)

| | | n | % |
|---|---|---|---|
| Opioid misuse | | | |
| | Yes | 46 | 35.4% |
| | No | 84 | 64.6% |
| Gender | | | |
| | Female | 71 | 54.6% |
| | Male | 59 | 45.4% |
| Race | | | |
| | White | 65 | 50.0% |
| | Black | 51 | 39.2% |
| | Others (Asian, Native American, and Hispanic) | 14 | 10.8% |
| Pain at more than one site | | | |
| | Yes | 109 | 83.8% |
| | No | 21 | 16.2% |
| Area of Pain | | | |
| | Spinal Pain | 101 | 77.7% |
| | Extremities (e.g., arm, leg, knee) | 58 | 44.7% |
| | Other parts of the body | 15 | 11.5% |
| Living Arrangements | | | |
| | Living alone | 42 | 32.3% |
| | Living with others | 88 | 67.7% |
| Education (years) | | | |
| | <=12 | 58 | 44.6% |
| | > 12 (some college or above) | 72 | 55.4% |
| | Mean (±SD) | 12.86 (±2.58) | |
| | Range | 4–24 | |
| Age | | | |
| | Mean (±SD) | 60.4 (±9.32) | |
| | Range | 50–92 | |

## Table 2

Summary of Chi-Squared Tests (N=130)

| | Misuse (n=46) | No misuse (n=84) | Chi-square | p-value |
|---|---|---|---|---|
| **Age** | | | | |
| 50 – 64 | 40 | 60 | 4.037 | .045 |
| 65+ | 6 | 24 | | |
| **Race** | | | | |
| White | 25 | 40 | 5.480 | .065 |
| Black | 20 | 31 | | |
| Others | 1 | 13 | | |
| **Sex** | | | | |
| Male | 25 | 34 | 2.307 | .129 |
| Female | 21 | 50 | | |
| **Education** | | | | |
| >12 | 26 | 32 | 4.084 | .043 |
| <=12 | 20 | 52 | | |
| **Living status** | | | | |
| Live alone | 19 | 23 | 2.635 | .105 |
| Live with others | 27 | 61 | | |
| **Depression** | | | | |
| 0–9 | 14 | 46 | 7.208 | .027 |
| 10–19 | 19 | 21 | | |
| 20+ | 13 | 17 | | |
| **Anxiety** | | | | |
| 0–17 | 29 | 55 | 0.802 | .670 |
| 18–24 | 8 | 10 | | |
| 25+ | 9 | 19 | | |
| **Alcohol Use Problem** | | | | |
| No | 28 | 66 | 4.651 | .031 |
| Yes | 18 | 18 | | |
| **Illicit Drug Use** | | | | |
| No | 34 | 81 | 14.762 | .000 |
| Yes | 12 | 3 | | |
| **Current pain severity** | | | | |
| 0–4 | 12 | 31 | 2.078 | .354 |
| 5–6 | 18 | 24 | | |
| 7+ | 16 | 29 | | |
| **BPI: Pain interference on general activity** | | | | |
| 0–4 | 8 | 21 | 2.104 | .349 |
| 5–6 | 14 | 17 | | |
| 7+ | 24 | 45 | | |
| **BPI: Pain interference on mood** | | | | |

| | Misuse (n=46) | No misuse (n=84) | Chi-square | p-value |
|---|---|---|---|---|
| 0–4 | 15 | 43 | 4.231 | .121 |
| 5–6 | 6 | 9 | | |
| 7+ | 25 | 32 | | |
| **BPI: Pain interference on walking ability** | | | | |
| 0–4 | 9 | 24 | 7.790 | .020 |
| 5–6 | 17 | 13 | | |
| 7+ | 20 | 47 | | |
| **BPI: Pain interference on normal work** | | | | |
| 0–4 | 5 | 22 | 9.295 | .010 |
| 5–6 | 16 | 12 | | |
| 7+ | 25 | 50 | | |
| **BPI: Pain interference on relationship with others** | | | | |
| 0–4 | 17 | 49 | 5.855 | .054 |
| 5–6 | 13 | 13 | | |
| 7+ | 16 | 22 | | |
| **BPI: Pain interference on sleep** | | | | |
| 0–4 | 14 | 25 | 3.949 | .139 |
| 5–6 | 3 | 16 | | |
| 7+ | 29 | 43 | | |
| **BPI: Pain interference on enjoyment of life** | | | | |
| 0–4 | 9 | 33 | 5.895 | .052 |
| 5–6 | 16 | 18 | | |
| 7+ | 21 | 33 | | |

Note. BPI=Brief Pain Inventory

**Table 3**

Summary of Logistic Regression (N=130)

| | Estimated Beta | Standard Error | Wald test | P value | OR (95% CI of OR) |
|---|---|---|---|---|---|
| **Constant** | −6.518 | 1.422 | 21.009 | .000 | .001 |
| **Age** | | | | | |
| Old | −.317 | .596 | .283 | .595 | .729 (0.227, 2.342) |
| **Education** | | | | | |
| High | .936 | .469 | 3.990 | .046 | 2.550 (1.018, 6.389) |
| **Alcohol Use Problem** | | | | | |
| Yes | .730 | .521 | 1.965 | .161 | 2.075 (0.748, 5.756) |
| **Illicit Drug Use** | | | | | |
| Yes | 2.546 | .811 | 9.859 | .002 | 12.755 (2.603, 62.497) |
| **Depression** | | | | | |
| Moderate | 1.744 | .576 | 9.178 | .002 | 5.723 (1.851, 17.690) |
| Severe | 1.171 | .659 | 3.154 | .076 | 3.225 (0.886, 11.746) |
| **Pain interference on walking ability** | | | | | |
| Moderate | .658 | .737 | .796 | .372 | 1.930 (0.455, 8.180) |
| Severe | −.944 | .823 | 1.315 | .252 | .389 (0.077, 1.954) |
| **Pain interference on normal work** | | | | | |
| Moderate | 1.862 | .802 | 5.390 | .020 | 6.438 (1.337, 31.006) |
| Severe | 1.267 | .899 | 1.986 | .159 | 3.550 (0.610, 20.679) |

Note. OR=Odds Ratio; CI = Confidence Interval;