Research in Social and Administrative Pharmacy xxx (2016) 1–7

Contents lists available at ScienceDirect

Research in Social and Administrative Pharmacy

journal homepage: www.rsap.org

Behavioral, mental, and physical health characteristics and opioid medication misuse among community pharmacy patients: A latent class analysis

Gerald Cochran [a, b, *], Valerie Hruschak [a], Jennifer L. Bacci [c], Kenneth C. Hohmeier [d], Ralph Tarter [e]

[a] University of Pittsburgh, School of Social Work, 4200 Forbes Ave. #2006, Pittsburgh, PA 15260, USA
[b] University of Pittsburgh, School of Medicine, Department of Psychiatry, 3811 O'Hara St, Pittsburgh, PA 15213, USA
[c] University of Washington, School of Pharmacy, Box 357631, H364 Health Sciences Building, Seattle, WA 98195-7631, USA
[d] University of Tennessee, College of Pharmacy, Department of Clinical Pharmacy, 193 Polk Ave. Suite 2D, Nashville, TN 37210, USA
[e] University of Pittsburgh, School of Pharmacy, 3501 Terrace St, Pittsburgh, PA 15261, USA

ARTICLE INFO

Article history:
Received 14 November 2016
Accepted 14 November 2016

Keywords:
Opioid medication misuse
Screening
Community pharmacy
Latent class analysis

ABSTRACT

Background: Community pharmacists are well-positioned to address the US opioid medication crisis, which has created a need to detect misuse risk in order to provide optimal patient care.
Objectives: This study sought to identify community pharmacy patient subgroups at risk for opioid medication misuse.
Methods: This study was a cross-sectional survey that examined behavioral, mental, and physical health characteristics among patients filling opioid pain medications. A convenience sample of adult patients filling opioid pain medications who were not receiving cancer treatment were screened in 2 urban and 2 rural community pharmacies in southwestern Pennsylvania. Patient subgroups were identified using latent class analysis. Latent class regression analysis was used to examine the association between subgroup membership and misuse.
Results: A total of 333 patients completed the survey (response rate 71.4%). Latent class analysis results showed that a 3-class solution best fit the data, which were labeled: *mental health* (8.4%, n = 28), *poor health* (79.6%, n = 265), and *hazardous alcohol use* (12%, n = 40). Individuals within the *mental health* subgroup had an increased risk for opioid medication misuse (Odds Ratio = 6.23, 95% CI = 5.13–7.33).
Conclusion: These findings demonstrate heterogeneity of this population receiving prescribed opioids and the potential to identify subgroups with high misuse risk. These findings also support routine screening of patients filling opioid medications and suggest the need for evidence-based patient-centered intervention development.

1. Introduction

Community pharmacists are continuing to position themselves as major contributors to addressing the opioid medication epidemic in the US. Advancements in the proliferation of pharmacist training to identify and provide interventions to patients who misuse opioid medications are rapidly moving forward.[1–8] This response is crucial given the serious threat posed to public health by continued misuse and overdose.[9] Previous research demonstrated that in 2014 approximately 4.3 million individuals were engaged in the non-medical use of pain medications in the US.[10] Furthermore, between 2001 and 2013, there was a >300% growth in opioid medication overdose deaths,[11] with 44 individuals currently experiencing fatal overdose daily.[12] Analyses of Medicaid data show, for instance, a marked increase for opioid medication overdose among those who misuse compared to those who do not.[13] Individuals involved in opioid medication misuse have a number of behavioral, mental, and physical health issues that increase risk for misuse, including co-occurring substance use disorders,[14–19] mental health/psychiatric conditions,[17,18,20–22] severe

* Corresponding author. University of Pittsburgh, School of Social Work, 4200 Forbes Ave. #2006, Pittsburgh, PA 15260, USA.
E-mail address: gcochran@pitt.edu (G. Cochran).

http://dx.doi.org/10.1016/j.sapharm.2016.11.005
1551-7411/

and chronic pain,[16,19,22–24] and poor general health/quality of life.[17,24]

Typical approaches for identifying patient risk characteristics for misuse employ null hypothesis testing statistical methods. Limitations associated with these approaches include sensitivity to sample size, lack of clinical significance despite achieving "statistical significance,"[25] and narrow ability to accurately represent multifactorial individual risk. Latent variable modeling can, in contrast, identify nuanced patient characteristics, develop theoretical and practical knowledge,[25–28] and elucidate complex health problems.[29] In latent class analyses (LCA), the variable of interest is unobserved but characterized by multiple observed indicators."[27,30] An important property of LCA is that it is a model-based approach for identifying homogeneous classes or "subgroups" according to a shared pattern of responses.[27,29,31,32] A main advantage of LCA is that it enables modeling of multiple variables with precision to characterize a subgroup of individuals' unique current or potential risk. Given the present national opioid crisis and the urgency to identify and provide care for patients engaged in or at risk for misuse, the application of LCA, therefore, is highly appropriate.

LCA may be especially useful for understanding misuse risk considering that individuals engaging in opioid misuse possess a variety of characteristics that have differential etiological salience. Aggregating individuals into distinct subgroups based on their particular configuration of risk characteristics enables accurate matching of interventions to the particular factors promoting and maintaining opioid misuse. Accordingly, the pharmacist has a unique opportunity to both accurately specify the pattern and severity of risk as well as inform intervention.

The purpose of the current project was to identify risk subgroups based on mental, behavioral, and physical health characteristics of patients filling opioid medications in community pharmacies. This study further sought to identify which subgroups of patients possessed the highest risk for reporting misuse of their opioid pain medications. The knowledge produced herein provides clinical pharmacists with valuable insight into characteristics of patients with the highest risk for misuse. The results of this study also have the capacity to provide clinical researchers with a foundation for further exploration of methods to identify individual and distinct health needs.

2. Materials and methods

2.1. Sample, recruitment, and survey

This study was a cross-sectional survey in 4 community pharmacies in southwestern Pennsylvania between September 2015 and June 2016, which methods have been described in detail elsewhere.[33] Patients dropping off new and/or refill prescriptions for any opioid pain medication were identified by pharmacists or pharmacy staff and asked if they were interested in completing a health screening questionnaire. Interested patients were handed a computer tablet wherein they were asked to confirm they were ≥18 years of age, not receiving treatment for cancer, and had not previously completed the survey. Qualified and interested individuals were prompted to continue to the next page where they were: informed about the purpose of the survey, given assurances of anonymity, and provided with contact information for the study Principal Investigator. Patients were also informed that they were not required to complete any of the questions, and if they chose to not participate in the study, their services at the pharmacy location would not be effected. Patients were also provided health and social services information if they wished to receive additional assistance. In order to enhance acceptability in the community pharmacy settings, the survey was brief, consisting of 45 multiple-choice or yes/no demographic, behavioral, mental, and physical health questions. Upon completing the survey, participants were given a $20 gift card. This study was designated exempt by the University of Pittsburgh Institutional Review Board.

2.2. Measurement model indicators

Five self-report measures of behavioral, mental, and physical health characteristics commonly associated with opioid medication misuse were administered: 1) the Alcohol Use Disorders Identification Test-C (AUDIT-C)[34] assesses hazardous alcohol consumption. This 3-item screener for hazardous drinking has a cut-off score of ≥3 for women and ≥4 for men.[34–36] 2) Drug use was screened using the Drug Abuse Screening Test-10 (DAST-10). The DAST is comprised of 10 items and assesses substance use severity.[37] A cut-off score of ≥1 indicates a need for intervention.[37] 3) Depression was screened using the 2-item Patient Health Questionnaire-2 (PHQ-2). A score of ≥3 indicates a positive screen.[38,39] 4) Post-traumatic stress disorder (PTSD) was assessed using the 4-item Primary Care-Posttraumatic Stress Disorder (PC-PTSD) screen, with a score of ≥3 indicating PTSD.[40–42] 5) Health was assessed using the Short-Form-12 Health Survey (SF-12).[43] The SF-12 contains valid single-item general health and pain subscales.[44] Variables were included in the measurement model as binary indicators (i.e., a positive/negative screen) to identify subgroups.

2.3. Opioid misuse and use indicators

Opioid medication misuse was assessed using the 6-item Prescription Opioid Misuse Index (POMI).[45] This measure asks about behaviors pertaining to mediation misuse, such as doctor shopping, taking medication at higher doses or more frequently than prescribed, and consumption to obtain psychological relief from stress/anxiety or to experience euphoria. A score of ≥2 affirmative responses indicates opioid medication misuse.[45] Patients were also asked to list their prescription opioid medication(s) they were obtaining in their visit to the pharmacy.

2.4. Analyses

Delineating unique subgroups was undertaken using LCA.[27] This statistical method has been frequently employed in substance abuse,[46–53] health services,[54–59] and mental health research.[60–63] Fit criteria and likelihood ratio tests were used to estimate an increasing number of subgroups until the optimum number was determined,[27,64] which included the Akaike Information Criterion,[65] Adjusted Bayesian Information Criterion (ABIC), in which lower values are better; and the Bootstrapped Likelihood Ratio Test (BLRT), in which 1 class minus a non-significant p-value (i.e., $p < 0.05$) indicates the optimal number of classes.[27,64] Using the behavioral, mental, and physical health screening instruments described above, the LCA method assigns each patient to a subgroup. A common convention for latent variable modeling suggests roughly 5 to 10 cases per parameter estimated in order to adequately power analyses.[66]

In order to identify the relationships between patients having a positive screen for prescription opioid medication misuse, demographic indicators, and subgroup membership; analyses also included a one-step latent class regression analysis.[67–69] Medication type was not included in the latent class regression analysis given lack of variability in medication use among some subgroups. The LCA estimation and regression analysis were conducted using Mplus 7.11.[70] Descriptive demographic and opioid medication filling information by subgroup are also presented.

Please cite this article in press as: Cochran G, et al., Behavioral, mental, and physical health characteristics and opioid medication misuse among community pharmacy patients: A latent class analysis, Research in Social and Administrative Pharmacy (2016), http://dx.doi.org/10.1016/j.sapharm.2016.11.005