Geriatric Opioid Harm Reduction: Interprofessional Student Learning Outcomes

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Abstract

Objective: Opioid harm reduction is increasingly important in the care of the older adults, who are at higher risk for negative opioid-related outcomes due to high prevalence of pain, multimorbidity, polypharmacy, and age-changes in metabolism. Our project aims to develop, implement, and evaluate an interprofessional opioid harm reduction service training. **Method:** This evaluation occurs in context of the Richmond Health and Wellness Program (RHWP), a community-based interprofessional wellness care coordination equity initiative, within buildings designated for low-income and disabled older adults. The geriatric opioid harm reduction training was delivered online and inperson, and followed up with case-discussions and practice. **Findings:** Pre ($n = 69$)/post ($n = 62$) student assessments indicated that after the training, there was an increase in knowledge. At follow-up, 60% recognized tramadol as an opioid, 50% at baseline. About 97% correctly indicated that MME represents morphine milligram equivalent, 80% at baseline. About 93% indicated that 50 MME level greatly increases opioid overdose risk, 62% at baseline. Only 20%, change from 60% at baseline, reported not being able to calculate MME at post assessment. **Conclusion:** Findings indicate that geriatric opioid harm reduction training within community-based wellness care coordination is feasible. Future works need to explore the impact on student practice in clinical settings and resident health.

Keywords

opioid harm reduction, overdose risk, aging, older adults

Introduction

Opioid overdose deaths are on the rise (National Institute on Drug Abuse, 2019), and older adults (aged 65 years or above) are at greatest overdose risk (Vu et al., 2018). In 2015–2016, 19.3% of older adults (aged 65 years and above), on average, filled at least one outpatient opioid prescription, and 7.1% obtained four or more prescription fills during the year (Moriya & Miller, 2018). Adults aged 65 years and above are at higher risk for negative outcomes associated with opioid analgesic use and misuse due to higher prevalence of multimorbidity, polypharmacy, and age-associated changes in opioid metabolism and elimination (Tilly et al., 2017). Furthermore, recent opioid use is associated with increased risk of fall and an increased likelihood of death in older adults (Daoust et al., 2018). Assessment, support, and referral for opioid harm reduction is an increasingly important issue in the care of the older adult population. Some evidence-based approaches exist for screening and treating of opioid misuse among older adults (Carew & Comiskey, 2018; Tilly et al., 2017). Improved practice dissemination and implementation, as well as training for health professionals, are continuously needed to monitor opioid harm reduction practices (Gordon & Harding, 2017).

A focus on older adults is needed as data from the National Health and Nutrition Examination Survey (1999–2014) shows that 25.4% of long-term users of opioids were indeed adults aged 65 years and above (Mojtabai, 2018). The 2012 to 2013 National Epidemiologic Survey on Alcohol and Related Conditions–III reported that 2.2% of adults aged 65 years and above experienced nonmedical use of

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prescription opioids during the past 12 months. About 5% of this population reported nonmedical use of prescription opioids during their lifetimes, which is an increase from previous cohorts (Saha et al., 2016). Pain treatment is attributed as a major cause for increased opioid use in older adults (Martin, 2018). About 40% of older adults report pain, compared with 30% of the general population (Le Roux et al., 2016). However, older adults are more likely to be exposed to high-dose opioids, coprescriptions with benzodiazepines, multiple opioid prescribers, multiple opioid-dispensing pharmacies, and continuous opioid therapy even without a pain diagnosis (Rose et al., 2019).

Medicare beneficiaries (aged and disabled) have among the highest and fastest growing rates of diagnosed opioid use disorder at more than six of every 1000 beneficiaries (Centers For Medicare and Medicaid Services, 2017). Older adults' opioid-related use of hospital and treatment center services increased sharply from 2005 to 2014; inpatient stays rose 85% for those aged 65 years and above. Patient demographic characteristics (e.g., male, older age), comorbidities diagnosed during hospitalization (e.g., drug use disorder, chronic pulmonary disease, psychoses), and other factors (Medicare or Medicaid primary payer, discharge against medical advice) are significantly associated with both opioid overdose and nonopioid overdose readmissions (Peterson et al., 2019).

Income also has an effect, with noninstitutionalized older adults who were poor (9.5%) or low income (11.3%) more likely than middle-income (6.8%) and high-income (4.5%) older persons to obtain four or more opioid prescription fills during the year (Moriya & Miller, 2018). Furthermore, the average annual rates of any outpatient opioid use increased as health status declined, ranging from 8.8% for those in excellent health to 39.4% for those in poor health (Moriya & Miller, 2018). Similarly, rates of frequent use increased from 1.6% to 21.8% as health status declined (Moriya & Miller, 2018). Health coverage status also has an effect on opioid use. Noninstitutionalized older adults on Medicare and other public insurance coverage are more likely to fill at least one opioid prescription (24.4%) and to have four or more opioid prescription fills (11.2%) than those with Medicare only (18.8% and 7.6%) and those with Medicare and private insurance coverage (18.9% and 6.1%; Moriya & Miller, 2018). Nationally, one third of Medicare Part D beneficiaries or 14.4 million people had at least one opioid prescription in 2016 (Office of Inspector General, 2017).

Evidence-based opioid harm reduction practices center around clinical education/empowerment, clinical/medication-assisted treatment, medication reviews, safe disposal programs, and screening/brief intervention (Administration for Community Living, n.d.; Korthuis et al., 2017). The implementation of evidence-based geriatric opioid harm reduction practices before a disorder or overdose occurs is needed for prevention within

wellness care coordination and community-based settings, especially in low-income settings (Korthuis et al., 2017). Thus, our project goals are to (a) Develop and implement an opioid harm reduction screening, support, and referral protocol for a community-based care coordination wellness program serving low-income older adults. (b) Develop, implement, and evaluate an opioid harm reduction training curriculum for health professionals to examine opioid knowledge, skills, and motivations.

Method

The geriatric opioid harm reduction quality improvement initiative began Fall 2018, with the implementation of evidence-based screening and wellness care coordination procedures, and the development of a training curriculum and program (Administration for Community Living, n.d.; Korthuis et al., 2017). We developed a curriculum to train and prepare health staff and students to successfully implement opioid harm reduction within the Richmond Health and Wellness Program (RHWP), a community-based interprofessional care coordination wellness initiative, providing integrated wellness care coordination to residents in housing units designated for low-income older or disabled adults (Parsons et al., 2019). The developed training was designed to be helpful beyond the RHWP context, but the delivery was contextualized to support RHWP wellness care coordination procedures.

RHWP includes faculty and students from Virginia Commonwealth University's Schools of Medicine, Nursing, Pharmacy, Psychology, Social Work and Allied Health Professions with experiential education for interprofessional care through weekly onsite clinics. RHWP sites have been providing wellness coordination to Richmond low-income senior public-housing residents since 2012. RHWP clients have a mean age of 73 years, 82% of individuals are Black or African American, have an average of 3.5 chronic conditions per individual, with higher rates of multiple chronic conditions than Medicare recipients within the same zip codes. The five most prevalent chronic conditions are hypertension, diabetes, heart disease, chronic obstructive pulmonary disease (COPD), and dyslipidemia for which individuals are taking more than 11 medications on average annually. Participants served by RHWP disproportionately experience high chronic disease burden, polypharmacy, challenges with social determinants of health, and uncoordinated health care. Although RHWP works with clients experiencing chronic pain, the clinic did not have a specific protocol in place to provide opioid harm reduction assessments, support, and referral.

Training Curriculum

The developed training curriculum focused on opioid harm reduction through the following themes: (a) Opioid

use background/epidemiological information, including health disparities and social determinants of health. (b) Risks and side effects of opioid use for older adults. (c) Identification of opioid medications and alternative pain management strategies. (d) Risk assessment by calculation of morphine milligram equivalent (MME). (e) Patient education, RHWP clinic procedures, including communication with primary care, and referral resources in the community. Training content addressed opioid safety and risk (Schepis et al., 2018) and overdose prevention (Musich et al., 2019), using foundational concepts from Substance Abuse and Mental Health Services Administration (SAMHSA): Rx Pain Medications Series (SAMHSA, 2017) and Centers for Disease Control and Prevention (CDC) guidelines (CDC Injury Center, 2018; Dowell et al., 2016), using SBIRT: Screening, Brief Intervention, and Referral to Treatment (SAMHSA-Health Resources & Services Administration [HRSA], n.d.-b) and motivational interviewing strategies for screening and counsel (Cole et al., 2011; SAMHSA-HRSA, n.d.-a). Prior to delivery, the geriatric opioid harm reduction quality improvement curriculum was reviewed by an expert advisory panel, organized through the Health Resources Services Administrations supplemental award to Virginia Geriatric Education Center's geriatrics workforce enhancement program. Staff and student training occurred in January 2019. The training and assessment activities were delivered online using blackboard; they were designed to approximately take 60 minutes to complete. Training content and materials were then reviewed in-person at clinic meetings, paired with case-based topic discussions and simulated opioid screening practice. Afterwards, a link was emailed to the students for the posttraining assessment.

Assessment/Analysis

To assess learning outcomes, baseline/follow-up questions mapping onto the training curriculum, assessed for change in knowledge, perceived skills, and motivations. Effect of the training curriculum was evaluated using analysis of variance with time as the independent variable for each item. For discrete variables, chi-squares were also analyzed, with time effects, for each question.

Results

Study Sample

The baseline sample was mostly 20 to 29 years old (79.4%), female (91.6%), Caucasian or White (64.1%), and graduate students (56.3%). Primary disciplines represented were nursing: nurse practitioner (30.8%), pharmacy (12.3%), and registered nurse (BSN; 34.7%). There were no demographic sample differences across baseline and post assessment.

There were significant changes in knowledge (Table 1). After the training, the students had increased knowledge for identifying opioid medications, specifically recognizing that gabapentin is not an opioid medication ($p = .0542$). Student also experienced increased understanding of MME ($p = .0088$), specifically understanding the overdose risk of 50 MME ($p \leq .0001$).

After training, there were significant increase in perceived skills (Table 1) for calculating MME ($p \leq .0001$). There were also significant increases in perceived skills for counseling older adults about opioid risk ($p = .0078$). Students also had significant increases in perceived skills for counseling older adults about alternatives to opioid medication use for pain ($p = .0214$). There were no changes in motivations as a result in participating in the training program. As illustrated in Table 1, there were high motivations at baseline.

Discussion

Our findings indicate that opioid harm reduction training within an interprofessional housing-based wellness care coordination model is feasible. Study findings indicate improved opioid-related knowledge and perceived skills as a result of the quality improvement geriatric opioid harm reduction initiative. There was no evidence for improvements in motivations. Data indicated that there was no change in motivations, as a result of a ceiling effect experienced at baseline, indicating high preexisting motivations to engage with clients in opioid harm reeducation, screening, education, and referral. The high preexisting motivations in the current study may be explained as an artifact of student willingness/participation for the RHWP geriatric rotation, and the result on the emphasis health professions programs are placing on addressing the opioid crisis.

There was still room for improvement in the knowledge and perceived opioid harm reduction skills, despite a health training confounder for high motivations, seen in the current study. Specifically, with regard to knowledge and skills, there was improvement for understanding and identifying opioid medications, MME overdose risk, and MME calculations. There was improvement in perceived skills for MME calculations, and counseling older adults on opioid harm reduction and opioid alternatives. There was no change, generally justified by existing knowledge/skills, in the conceptualization of opioid risk, side effects, older adult risks, alternatives, and clinical management.

This study presents a basis by which further trainings, and more in-depth and focused trainings, could be developed and tested for efficacy. It is important to consider study findings within the study limitations for future research. As a result of attrition and no active tracking system, not all students completed the assessments, despite taking part in the mandatory RHWP training. Although a record was not kept for training participation levels; future studies need to track training participation to account for exposure to training materials and consider mandatory assessment

Table 1. Learning Outcomes.

Knowledge (% yes)	Time 1	Time 2	p value[a]
Identify gabapentin as an opioid medication.	6%	0%	.0542
	0.06	0.0	.0548
Identify MME measures morphine milligram equivalent.	83%	97%	.0088
	0.83	0.97	.0085
Identify 30 MME level greatly increases risk for overdose.	39%	16%	.0035
	0.39	0.16	.0033
Identify 40 MME level greatly increases risk for overdose.	39%	11%	.0003
	0.39	0.11	.0002
Identify 50 MME level greatly increases risk for overdose.	62%	94%	<.0001
	0.62	0.94	<.0001
Identify depression as a side-effect of long-term opioid use.	90%	100%	.0099
	0.90	1.00	.0097

Skills (% yes)	Time 1	Time 2	p value[b]
Can you calculate an MME?	43.5%	82.3%	<.0001
	2.26	2.95	<.0001
Can you counsel older adults about opioid risks?	78.3%	96.8%	.0078
	2.93	3.26	.0037
Can you counsel older adults about alternatives to opioid use?	87.0%	96.8%	.0214
	3.06	3.35	.0062

Motivations (% agree/strongly agree)	Time 1	Time 2	Total[c]
Are you willing to help older adults at risk for opioid overdose?	98.6%	98.4%	98.5%
Are you willing to assist clinicians manage older adult opioid risk?	100%	98.4%	99.2%
Are you willing to advocate for better opioid risk management for older adults?	100%	98.4%	99.2%
Are you willing to train other clinicians to manage older adult opioid risk?	85.9%	91.9%	90.8%
Are you willing to specialize or working directly with older adults managing opioid risk?	85.5%	88.7%	87.0%

Note. Analysis of variance and chi-squares were examined.
[a]No changes in knowledge of identifying oxycodone (100%); morphine (100%); fentanyl (95.7%, 100%); and tramadol (42%, 51.6%). No changes in knowledge of identifying opioids risks: injury (95.7%, 96.8%); overdose (97.1%, 98.4%); disease/death (94.2%, 95.2%); and addiction (100%, 98.4). No changes in knowledge of identifying side-effect of long-term opioid use: tolerance (95.7%, 95.2%); increased sensitivity to pain (73.9%, 87.1%); and overdose (89.9%, 90.3%). No changes in knowledge of identifying alternative opioid pain strategies: exercise/physical therapy/massage (100%); acetaminophen (84.1%, 77.4%); and cognitive behavioral therapy (94.2%, 96.8%). No changes in knowledge of identifying older adults at greater opioid overdose risk due to multiple medication interactions (97.1%, 98.4%); metabolic age changes (97.1%, 96.8%); and long-term use (88.4%, 91.9%). [b]No changes in perception of skills to be able to identify an opioid medication (91.3%, 98.4%). No changes in understanding health professional responsibilities for when encountering an older adult at opioid overdose risk: education (82.6%, 85.5%); treat (66.7%, 54.8%); refer (69.6%, 75.8%); monitor/track (73.9%, 61.3%); follow-up (68.1%, 56.5%); screen (75.4%, 80.7%); evaluate (71.0%, 61.3%); and counsel (71.0%, 58.1%). [c]No significant changes for motivations.

performance. Students were not measured for change in clinical opioid management skills. The study assessment measured perceived skills rather than actual skills performed in the clinical setting; future studies need to measure change in practiced clinical skills. Without a long-term follow-up, we were not able to estimate the sustainability of the learning gains. Future studies need to incorporate a long-term recording period follow-up on training outcomes to assess sustainability in related efficacy research. Future research also needs to study the older adult, and examine if receiving cared by trained health professionals motivates them to engage in greater self-advocacy of their own pain management and care.

In conclusion, the evidence produced from program evaluation at RHWP will contribute to future work that aims to improve the public health impact of inappropriate opioid use, particularly for older adults. RHWP continues to engage in research informed practice and practice informed research in a feedback loop with residents, researchers, and clinicians to supplement high education. Future work needs to explore the impact of the geriatric opioid harm reduction quality improvement initiative on the behaviors of health professions students in practice and ultimately on the clients served at clinics.

Declaration of Conflicting Interests

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