

Introduction

According to a 2019 report from the National Institute on Drug Abuse, on average more than 130 individuals die every day from opioid overdose in the United States.¹ Over the last two decades, the number of overdose deaths due to synthetic opioids has dramatically increased from 0.3 deaths per 100,000 in 1999 to 6.2 deaths per 100,000 in 2016.² Of people who use prescription opioids for chronic pain, roughly 21 to 29% misuse them, and between 8 to 12% develop an opioid use disorder.¹ This public health crisis has also led to social and economic welfare problems. Estimates show that indirect costs of prescription opioid misuse are estimated to be \$78.5 billion.³ This amount is attributed to increased health care, substance abuse treatment, criminal justice costs, and lost productivity.³

The mechanism behind preventing death from opioid overdose is the reversal agent, naloxone, an opioid antagonist, which was first approved by the Food and Drug Administration (FDA) in 1971.⁴ Initially, it was developed for intramuscular and intravenous injection by medical professionals to treat opioid overdose. The first patient-friendly intranasal naloxone device (Narcan®) was developed and approved by the FDA in 2015.⁵ In 2016, Evzio® was approved as the first naloxone auto-injector to reverse opioid overdose.⁴ Then in April 2018, the United States Surgeon General released an Advisory on Naloxone and Opioid Overdose, which strongly urged healthcare practitioners, patients, family, and friends of those who use opioid medications, to consider obtaining naloxone. The advisory emphasized the importance of keeping the device within reach and knowing how to properly use the device in order to save lives from opioid overdose.⁶ Despite this strong recommendation, a 2018 Centers for Disease Control (CDC) report indicated that less than 1% of patients recommended to have naloxone on hand for emergency purposes actually receive the medication.⁷ Recently published data from the CDC indicates there was a 106% increase in naloxone prescriptions from 2017 to 2018; however, the rates of naloxone dispensing were still very low in 2018 with only one naloxone prescription being dispensed for every 69 high-dose opioid prescriptions.⁸

Community pharmacists are among the most accessible healthcare professionals and, in light of the current opioid epidemic, are often asked a variety of questions about opioid medications.⁹ The CDC describes pharmacists as essential members of the healthcare team in preventing opioid misuse and overdoses by engaging in prevention efforts.¹⁰ A small number of pharmacies have successfully implemented pharmacist-driven interventions to increase naloxone dispensing specifically via staff education and patient counseling.¹¹ More research is needed to identify patients' knowledge and perceptions related to opioids and naloxone in order to determine the perceived barriers for uptake of naloxone prescriptions in community pharmacies.

Methods

A prospective, cross-sectional, 29-item survey was developed utilizing a modified version from Smith, et al.¹² The survey was administered at four community pharmacies operated by Balls Food Stores (BFS), a grocery store chain in the Kansas City metropolitan area. Survey questions included multiple-choice, single-answer, true/false, agree/disagree, and free-text response. The survey assessed demographic information, evaluated knowledge and perceptions of opioid drugs and naloxone, and evaluated participant comfortability talking to pharmacists about opioid drugs and naloxone. The survey was piloted among a convenience sample of six volunteers to assess clarity and feasibility. Written naloxone patient education materials included a one-page handout that was developed by the primary investigator utilizing resources from the CDC.

Participants were included in the study if they were 18 years of age and older and could speak and read in English. The surveys were administered to patients presenting to one of the four community pharmacies for an influenza or herpes zoster vaccine from October 2019 to January 2020. Each patient received a clipboard with the vaccine consent form and the survey. Patients were encouraged to complete the optional, anonymous survey while waiting for their vaccine to be administered. The

completed surveys were placed in a locked survey collection box to which only the primary investigator had access. After completing the survey, participants were handed written naloxone patient education materials. Participants were incentivized to complete the survey with points added to a grocery store rewards club account. The study was granted exemption from the University of Kansas Medical Center Human Research Protection Program.

Statistical analyses were performed using SPSS version 26 (IBM Corp, Armonk, NY) with an a-priori alpha value of 0.05. Descriptive statistics were used to assess demographics, and chi-square evaluated knowledge and perceptions of opioid drugs and naloxone based on: (1) education level and (2) personal or family use of opioid drugs. To analyze naloxone dispensing, the pharmacy dispensing software was utilized to compare the four months before and after implementation of written education materials.

Results and Discussion

A total of 267 surveys were collected. Demographic information can be found in Table 1. Over half (n=154, 58%) of the participants knew that a medication is available to reverse an opioid overdose. Nearly all participants reported comfortability speaking to a pharmacist about opioid drugs (n=242, 92%), and asking the pharmacist questions about naloxone (n=233, 90%).

Six of eight items evaluating negative perceptions between participants based on education level reached statistical significance. Specifically, individuals who obtained a high school degree or less were more likely to agree with negative perception items (Figure 1A). Survey items of negative perceptions were also compared between participants based on reported personal or family use of opioid drugs. Individuals with no personal or family opioid use more frequently agreed to negative perceptions when compared to participants with personal or family opioid use; however, none of these comparisons reached statistical significance (Figure 1B). Naloxone dispensing doubled from the four months before distribution of written education materials compared to the four months after distribution of written education materials (two prescriptions vs. four prescriptions); however, statistical evaluation was not possible due to the small sample.

The results of this study indicate that there are many opportunities for community pharmacists to educate the public about opioid overdose and naloxone, with the ultimate goal of increasing naloxone access to prevent opioid overdose-related deaths. To the authors' knowledge, this is the first study to assess the knowledge and perceptions of the general public regarding use of both opioid drugs and naloxone in the community pharmacy setting. It is prudent to identify negative perceptions and stigmas that exist among the general public in order to address barriers that prevent the uptake of naloxone dispensing in the community pharmacy setting.

Our results show that approximately 58% of participants were aware that a medication is available to reverse an opioid overdose. This is consistent among other studies, which found between 59 to 65% of participants had knowledge of naloxone or knew a medication was available to reverse opioid overdose.¹²⁻¹⁴ However, a study by Tobin et al. demonstrated that 90% of participants were aware of naloxone.¹⁵ The population in the Tobin study was comprised entirely of participants with a history of self-reported heroin use in their lifetime.¹⁵ This fact may explain the difference since two-thirds of individuals in the Tobin study had reported lifetime personal overdose experience and nearly all (90%) had witnessed an overdose.¹⁵ This demonstrates that without personal or observed overdose experience, a general lack of awareness of naloxone still exists amongst a good proportion of the public. Patient education is essential to expand awareness of naloxone to ultimately increase access to individuals to have on hand for potential future overdose emergencies.

In addition to identifying a gap in naloxone awareness among the general public, our study also showed that survey participants with lower education levels, specifically those with a high school diploma or less, were more likely to agree to negative perceptions of opioid drugs and naloxone

compared to individuals who completed some college education or higher. This pattern has also been demonstrated by other studies.^{16, 17} Sola and colleagues revealed that participants with lower education levels were more likely to have a stronger negative attitude regarding treatment with opioid drugs.¹⁶ Another study concluded that one-third of participants were uncomfortable with pharmacists dispensing naloxone due to the beliefs that it would encourage drug abuse or misuse and promote reckless behavior.¹⁷ The majority (59%) of participants from this study reported the highest level of education achieved as a high school diploma.¹⁷ The results from the current study along with the similar data that is shown from Sola and Haggerty indicate there is a significant need for patient education regarding opioids and naloxone. Lower education levels can lead to increased stigma through a lack of understanding or awareness of correct information. Pharmacist-led patient education can allow for the formation of more accurate opinions regarding these medications to hopefully destigmatize opioid drugs and naloxone.

Pharmacists are well-positioned to lead opioid and naloxone patient education due to the ease of accessibility and high trust that is placed in the profession.^{9, 18} Additionally, our study highlights the high patient comfortability that is seen when discussing sensitive subject matter, such as opioids and naloxone, with a pharmacist. We identified that 92% of participants felt comfortable discussing opioid drugs with a pharmacist. Similarly, Thakur and Chewing demonstrated in their qualitative study that participants strongly supported a pharmacist giving them information regarding opioid dependency and overdose risks.¹⁹ This demonstrates that community pharmacists are uniquely placed to lead opioid and naloxone patient education due to the trust that patients have in the profession. Through education, pharmacists can help patients navigate the plethora of information that exists regarding the opioid epidemic. One-on-one pharmacist-led counseling sessions should be provided with each new opioid prescription to inform patients regarding the risks of the medication and signs and symptoms of an overdose.

Our study also showed that nearly 90% of participants felt comfortable asking the pharmacist questions about naloxone. In addition, a qualitative study by Hartung and colleagues concluded that patients believed pharmacists have an essential role to optimize and support safe medication use in the opioid epidemic.²⁰ A key step in supporting safe medication use with regards to opioid prescriptions is to recommend naloxone for patients that are at risk for opioid overdose. The high patient comfortability levels that are seen in our study place pharmacists in an excellent spot to recommend naloxone. Pharmacist-led patient education should discuss the importance of having naloxone on hand for those who are personally at risk of opioid overdose or if they have a friend or family member that is at risk as well. When recommending naloxone, pharmacists should directly address patient-specific concerns to overcome anticipated barriers to ensure patients receive the life-saving medication.

The final part of our study aimed to see if written education materials would increase naloxone dispensing in community pharmacies. Despite a doubling of naloxone prescriptions dispensed between the four pharmacy locations, the number still remains low with only four prescriptions being dispensed in the four months post-implementation of written education materials; additionally, statistical analysis could not be utilized due to this low sample size. This demonstrates that providing written education materials without a face-to-face education session is not sufficient for expanding naloxone access to individuals that are recommended to have it on hand. Face-to-face education and counseling has been evaluated to determine if there is an increase in naloxone dispensing. A previous study reported a 4.5-fold increase in naloxone dispensing over a three month period through utilization of intentional counseling sessions that discussed patient-specific risk factors for overdose.¹¹ Despite this increase, only 34% of patients agreed to the naloxone offer and only half of those patients actually received the medication.¹¹ A major reason that is cited as to why patients initially declined the naloxone offer was due to patients already having a device at home; however, the study did cite other reasons of naloxone refusal due to existing stigma surrounding the subject matter.¹¹ Our results, along with the results from

the Griffin study, indicate that while efforts have been successful to increase access to naloxone, there is still much work to be done. The first step in increasing access is to reduce the negative stigma that is associated with opioids and naloxone. Pharmacists have extensive background in opioid pharmacology, overdose signs and symptoms, and naloxone administration techniques. Paired with the trust that patients have in our profession with the high comfort levels that were demonstrated in our study, pharmacists make an excellent choice to lead the charge on overdose education to further increase naloxone access.

There were limitations to this study. First, participant responses were potentially impacted by a response bias due to the negative stigma associated with the survey subject matter. Additionally, there was a low incidence of surveys completed by participants who use opioid drugs (n=15, 6%) or those who have a family member who uses opioid drugs (n= 13, 5%). The study sample also lacked diversity; thereby, it is unknown if the study results may be generalizable to other populations. Another limitation of this study is the large proportion of participants that reported attaining a college degree or higher. When compared to results described in the 2018 United States census data, the participants of the current study reported a higher level of education than the general population (67% vs. 32%).²¹ Lastly, some participants did not complete the survey in its entirety. Responses to survey questions were not required and unanswered items may have impacted the results of this study; however, the responses from incomplete surveys were included in data analysis.

The study highlights the role community pharmacists can play in patient education due to the negative perceptions of opioids and naloxone that are seen among individuals with lower education levels. Additionally, the study shows that pharmacists are well-positioned to be an integral part of patient education due to the high patient comfortability that was demonstrated when speaking with a pharmacist about opioids and naloxone. Increasing patient knowledge to ensure patients are receiving correct information regarding opioids and naloxone is a key step in combating the opioid epidemic that is presently plaguing the country. Further research is needed to identify specific education initiatives and interventions that may lead to increased acceptance of naloxone in the community pharmacy setting.

Conclusions

Survey participants with lower education levels were more likely to agree to negative perceptions of opioid drugs and naloxone. Additionally, nearly all survey participants felt comfortable discussing these medications with a pharmacist. This demonstrates that pharmacists are well positioned to provide patient education regarding opioid drugs and naloxone, with the goal of increasing acceptance of naloxone to prevent opioid overdose-related deaths.

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