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## REVIEW

## Pharmacists' attitudes, knowledge, utilization, and outcomes involving prescription drug monitoring programs: A brief scoping review

Kirbee Johnston, Lindsey Alley, Kevin Novak, Sarah Haverly, Adriane Irwin, Daniel Hartung\*

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## ABSTRACT

**Objective:** While literature on pharmacists' engagement with prescription drug monitoring programs (PDMPs) is growing, no formal synthesis of findings has been conducted to provide overarching recommendations for research or practice. The objective of this study was to identify and synthesize findings from current literature on community pharmacists' attitudes toward, knowledge of, and registration and utilization behaviors regarding PDMPs.

**Data sources:** Electronic databases (MEDLINE, PsychINFO, Cochrane Database of Systematic Reviews, Google Scholar, and the Brandeis University PDMP Center of Excellence) and reference lists from relevant manuscripts were searched for relevant English-language manuscripts. Key words used in searches included pharmacist, prescription drug monitoring program, opioid safety, attitudes, knowledge, and utilization.

**Study selection:** Papers were included from January 1, 2008 up to October 6, 2017. Three authors independently screened articles for full text review; 2 authors independently conducted full text review for final study selection. Discrepancies were resolved through consensus.

**Data extraction:** Data were extracted to an evidence table, coded by topic category, and checked for accuracy.

**Results:** Fifteen manuscripts met inclusion criteria. The studies varied greatly in methodological approach. In general, pharmacists' attitudes and knowledge of PDMPs positively influenced likelihood to register and use their state's program. Targeted training had a substantial impact on knowledge, registration, and utilization.

**Conclusion:** Pharmacist-targeted PDMPs and opioid safety training is highly recommended to increase knowledge of and insight into behavioral change.

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As the opioid crisis continues to escalate in the United States, federal, local, and academic efforts are under way to examine opioid-related harms and their relationship to prescribing practices.<sup>1,2</sup> While overdose from heroin and illicitly

manufactured synthetic opioids constitutes more than half of all opioid overdoses, prescription opioids contributed to more than 17,000 deaths in 2016, an increase of 10.6% from 2015.<sup>3</sup> In the same year, over 200 million opioid prescriptions were dispensed in pharmacies across the United States, at a rate of 66.5 per 100 persons.<sup>4</sup>

Current efforts to reduce inappropriate opioid prescribing include prescriber education, medication surveillance, and health care system and payer policy restrictions. Although most interventions have been directed at prescribers, pharmacists play an important role in ensuring patient safety during the treatment process, and they have arguably received the least attention in opioid safety and outcomes-related research. The community pharmacy profession has evolved considerably to embrace more patient-centered medication management models of care, and pharmacists'

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\* **Correspondence:** Daniel Hartung, PharmD, MPH, Oregon State University–Oregon Health and Science University College of Pharmacy, 2730 SW Moody Ave., Mailcode: CL5CP, Portland, OR 97201.

E-mail address: [hartungd@ohsu.edu](mailto:hartungd@ohsu.edu) (D. Hartung).

**Key Points****Background:**

- The role of community pharmacy in addressing the opioid crisis is expanding rapidly, but opportunities for pharmacist intervention remain ill defined; tailored trainings and policies are inconsistent or unavailable.
- Prescription drug monitoring programs (PDMPs) provide community pharmacists an opportunity to minimize opioid-related harms and improve patient safety.
- Understanding pharmacists' existing attitudes, knowledge, and utilization regarding the PDMP is critical to improve future intervention research and enhance PDMP use.

**Findings:**

- Attitudes regarding the PDMP and knowledge of its use positively influenced pharmacists' likelihood to register and use the program.
- Pharmacist-targeted training on PDMP use and importance greatly affected knowledge, registration, and utilization.
- Methodologically rigorous, theoretically grounded studies are needed to measure these effects more thoroughly and accurately.

roles in opioid safety are expanding quickly, although best practices and expectations remain ill defined. Prescription drug monitoring programs (PDMPs) provide a potential avenue for pharmacists to better engage patients and providers around opioid safety by facilitating enhanced patient counseling, monitoring for opioid safety risks, potentially intervening to prevent misuse or abuse, and recommending naloxone if appropriate.<sup>5-8</sup>

PDMPs are state-specific electronic databases that contain regularly updated patient data for scheduled drugs, and they allow physicians and pharmacists to see patterns of controlled substance prescribing and dispensing through patient reports.<sup>6,7</sup> PDMPs are currently active in 49 states, with varying mandated-use and registration policies. Despite the potential benefits to improve patient safety, many health care providers report difficulty integrating PDMP queries into their daily workflow.<sup>6,9-11</sup> Commonly stated barriers include unfamiliarity with or dislike of the user interface, difficulties working collaboratively with providers or patients in response to troubling PDMP reports, concerns about legal liability, and unwillingness to devote time regularly engaging the program when practicing in a state without a mandated use policy.<sup>6,10,11</sup> All these barriers could be addressed through targeted and tailored training, as it is established that training plays an important role in shaping attitudes and knowledge.<sup>12,13</sup>

It is critical that investigators begin objectively and comprehensively examining the relationship pharmacists

have with their state's PDMP. The purpose of the current review is to identify and synthesize literature specific to community pharmacists' attitudes and knowledge regarding PDMP use and communication, behavioral intentions to use the program, and actual registration, utilization, and outcomes. Specifically, the following areas were examined: 1) community pharmacists' knowledge and attitudes regarding PDMP registration, use, and impact; 2) the impact of attitudes and knowledge on PDMP registration and utilization; and 3) dispensing and patient health outcomes resulting from pharmacists' use of the PDMP. An overview of current findings and recommendations for future research areas and methodologies are provided.

**Methods**

A scoping review was conducted to examine the areas of interest. Scoping reviews summarize the breadth and depth of current literature to address broad topics.<sup>14,15</sup> Scoping reviews are beneficial when the literature uses varying methodologies, no prior review has been performed to synthesize the topic, and identifying a narrow research question is difficult.<sup>16</sup> Unlike systematic reviews, scoping reviews do not aim to evaluate the quality of the literature.<sup>16</sup>

An extensive search was conducted of MEDLINE, PsychINFO, Cochrane Database of Systematic Reviews, Google Scholar, the Brandeis University PDMP Center of Excellence, and reference lists from relevant manuscripts. The search strategy used combinations of the following terms: pharmacy or pharmacist AND prescription monitoring program, prescription drug monitoring program, controlled substance database, PDMP, PMP, attitudes, knowledge, opioids, opioid safety, dispensing, or utilization. In addition, a call was placed for unpublished manuscripts and data to several pharmacy-based listservs (Figure 1). The eligible publication dates used in the search ranged between January 1, 2008 and October 6, 2017.

To be included, articles needed to be written in English, include community pharmacists in the study sample, report on PDMPs operating in the United States, and address at least one of the areas of interest: attitudes, knowledge, registration, and utilization. Studies were screened independently and coded for full-text review by 3 of the authors. Full-text review was also conducted independently for final study selection by 2 authors. Discrepancies were resolved through consensus, although agreement on "articles for inclusion" was high (Cohen's  $\kappa = 0.91$ ). Data were extracted into an evidence table and checked for accuracy. Methodologies, including measurement tools and the operationalization of outcome variables, varied considerably across studies, making a quantitative meta-analysis unfeasible. The few studies examining outcomes of community pharmacists' PDMP use defined outcomes in terms of dispensing practices and pharmacist-patient education and communication. Thus, a qualitative synthesis was performed. Findings should be considered in the context in which they were reported, as PDMP-related attitudes and knowledge may be greatly influenced by the state and year in which the data were collected.

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