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Original Research

Prescription drug monitoring program utilization in Kentucky community pharmacies

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ABSTRACT[*]

Objective: Identify characteristics of Kentucky community pharmacists and community pharmacists' practice environment associated with utilization of the Kentucky All Schedule Prescription Electronic Reporting Program (KASPER).

Methods: Surveys were mailed to all 1,018 Kentucky pharmacists with a KASPER account and an additional 1,000 licensed pharmacists without an account. Bivariate analyses examined the association between KASPER utilization and practice type (independent or chain) and practice location (rural or urban). A multivariate Poisson regression model with robust error variance estimated risk ratios (RR) of KASPER utilization by characteristics of pharmacists' practice environment.

Results: Responses were received from 563 pharmacists (response rate 27.9%). Of these, 402 responses from community pharmacists were included in the analyses. A majority of responding pharmacists (84%) indicated they or someone in their pharmacy had requested a patient's controlled substance history since KASPER's inception. Bivariate results showed that pharmacists who practiced in independent pharmacies reported greater KASPER utilization (94%) than pharmacists in chain pharmacies (75%; p<0.001). Multivariate regression results found utilization of KASPER varied significantly among practice environments of community pharmacists with those who practiced in an urban location (RR: 1.11; [1.01–1.21]) or at an independent pharmacy (RR: 1.27; [1.14–1.40]) having an increased likelihood of KASPER utilization.

Conclusion: Utilization of KASPER differs by community pharmacists' practice environment, predominantly by practice type and location. Understanding characteristics of community pharmacists and community pharmacists' practice environment associated with PDMP use is necessary to remove barriers to access and increase utilization thereby increasing PDMP effectiveness.

Keywords: Substance Abuse Detection; Adverse Drug Reaction Reporting Systems; Mandatory Reporting; Community Pharmacy Services; Professional Practice; Prescription Drugs; United States

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INTRODUCTION

The abuse and misuse of prescription drugs is a major public health concern[1] and characterized as an epidemic in the US.[2] In an effort to address the problem of prescription drug abuse and diversion, states have enacted legislation for the creation of prescription drug monitoring programs (PDMPs) to track controlled substance (CS) dispensing.[3] Reports detailing a patient's CS prescription history can be accessed upon request, or proactively distributed depending upon state regulations. As of December 2013, PDMPs are operational in 48 states.[4]

In 1999, Kentucky implemented the Kentucky All Schedule Prescription Electronic Reporting (KASPER) program allowing prescribers, pharmacists, and law enforcement officials to request reports providing detailed information regarding an individual's CS prescription history. In 2005, a fully electronic version of KASPER was launched allowing pharmacists and prescribers to receive KASPER reports in real-time, permitting them to utilize a patient's CS prescription history to make treatment decisions at the point of care.

Characteristics and opinions of healthcare professionals who utilize PDMP reports have been assessed. In Kentucky, satisfaction surveys conducted in 2004, 2006, and 2010 captured prescriber, dispenser, and law enforcement opinions of KASPER.[5-7] Results showed the majority of KASPER users were satisfied with the system and believed it to be effective, efficient, accurate, and useful to identify CS abuse and diversion. A 2010 study of Ohio community pharmacists examined factors influencing enrollment in the state's PDMP.[8] Factors influencing the decision to enroll were ability to assist in decreasing doctor shopping and drug abuse, Internet access, and receiving education about the PDMP. A survey of Florida pharmacists assessing attitudes regarding implementation of a PDMP found that responding pharmacists agreed a PDMP should be implemented and would reduce the incidence of doctor shopping.[9] Most recently, Green and colleagues surveyed pharmacist users of PDMPs in Connecticut and Rhode Island and concluded pharmacists use PDMP data to screen for abuse and doctor shopping, but PDMP use had limited impact on other aspects of pharmacy practice including counseling patients on safer opioid use, and providing guidance on proper storage and disposal of unused medications.[10] The

impact of practice setting was not assessed and noted as being an important limitation to the study as "practice setting may influence the frequency with which pharmacists access PDMPs and how PDMP information obtained is used".[10]

Studies evaluating the effectiveness of PDMPs suggest they successfully reduce the supply of CS.[11,12] This reduction in supply may not be associated with improved health outcomes, specifically reductions in drug overdose mortality rates.[13,14] However, some states with rigorous PDMPs report recent reductions in overdose mortality[15,16] and increasing evidence suggests that utilization of PDMP reports reduces "doctor shopping".[17] Because policies regarding access to and utilization of PDMP reports by healthcare providers vary among states[4], it is possible that PDMP effectiveness is limited due to inadequate use of PDMP reports at the point of care. A 2010 independent evaluation of the KASPER program revealed 16% of licensed pharmacists and 27.5% of licensed CS prescribers were registered with the PDMP.[18] These registration numbers parallel estimates reported by other states, suggesting that overall less than 25% of healthcare professionals access PDMPs to obtain patient reports.[19] Increased utilization of PDMP reports by healthcare professionals, including pharmacists, could assist PDMPs in meeting their stated objectives.

Understanding characteristics associated with PDMP use may assist in developing strategies to increase utilization, thereby increasing PDMP effectiveness. The purpose of this study was to examine the association between characteristics of pharmacists and pharmacists' practice environment with KASPER use, and determine if specific characteristics increased the likelihood of utilizing KASPER.

METHODS

Survey methodology elicited community pharmacists' perceptions regarding KASPER's impact on CS dispensing and effectiveness in Kentucky in 2009. Survey items were developed by health policy researchers and academic pharmacists based on reviews of previous PDMP surveys[5-7] and discussions with KASPER staff. The survey instrument was designed to take approximately ten minutes to complete and was pilot tested to verify clarity and length. All 1,018 Kentucky pharmacists with a KASPER account at the time of the survey, and 1,000 additional pharmacists without an account randomly selected from a list of 6,600 actively licensed pharmacists in Kentucky were contacted by mail to complete a 15-item survey.

The survey packet included a postcard with a link to an electronic version of the survey and an identification code giving the pharmacist the option of returning the survey via mail or completing it online. Reminder postcards and second surveys were sent two weeks after the initial mailing. Survey protocol was approved by the Institutional Review Board at the University of Kentucky and the Kentucky Cabinet for Health and Family Services.

Bivariate analyses examined associations between practice type (independent versus chain) and practice location (rural versus urban) with pharmacists and practice environment characteristics. Practice type classifications were based on how the pharmacist described their practice, with independent, chain, and supermarket pharmacies considered community pharmacies. For this analysis supermarket pharmacies were grouped with chain pharmacies. Rural/urban classifications were based on the 2003 Rural-Urban Continuum (RUC) Codes developed by the US Department of Agriculture.[20] Counties with an RUC code of 1, 2, or 3 were grouped as urban while counties with an RUC code of 4 or greater were considered rural.[20] Statistical significance was evaluated using the Wald chi-square for categorical demographic data. Data normality for continuous variables was tested using the Shapiro-Wilk test and differences assessed using the nonparametric Kruskal-Wallis test.

A Poisson regression model using a robust error variance adjusting for characteristics of pharmacists' practice environment, years since licensure, daily CS dispensing volume, and perceived effectiveness of KASPER estimated the relative risk and associated confidence intervals (CI) of KASPER utilization by community pharmacists. For this study KASPER utilization was defined as having requested information regarding a patient's CS prescription history since the inception of KASPER. Covariates were hypothesized to predict KASPER utilization (e.g., pharmacists with more years since licensure less likely to use KASPER; higher CS dispensing associated with greater likelihood to utilize KASPER; perception of KASPER being an effective tool associated with increased likelihood of utilization). Statistical analyses were conducted in Stata v12.0 (StataCorp LP, College Station, TX). The a priori level of significance was set at 0.05.

RESULTS

Descriptive and Bivariate

Surveys were mailed to 2,018 pharmacists in Kentucky of which 563 were returned (response rate 27.9%). Thirteen returned surveys were deemed incomplete and removed from further analysis. Another 26 observations were excluded because the respondent indicated they practiced outside Kentucky, and 120 were excluded because the pharmacist did not specify their practice type as a community pharmacy. Two additional observations were excluded because the question pertaining to KASPER use was not answered. Overall, 402 observations were included in the analyses.

Of the responding pharmacists, 339 (84%) indicated they or personnel in their pharmacy had requested a patient's CS prescription history from KASPER since the inception of the program. Among the pharmacists who had not requested CS prescription

Table 1. Baseline Characteristics of Community Pharmacists by Practice Type and Practice Location

Variable	Practice Type					Practice Location				
	Independent N= 200		Chain N = 202		p-value	Rural N = 173		Urban N = 217		p-value
KASPER Utilization										
Requested Reports	187	94%	152	75%	<0.001*	145	84%	183	84%	0.890
Practice Location										
Rural	115	58%	58	29%	<0.001*	-	-	-	-	-
Urban	75	38%	142	70%	<0.001*	-	-	-	-	-
Practice Type										
Independent	-	-	-	-	-	115	66%	75	34%	<0.001*
Chain	-	-	-	-	-	58	33%	142	65%	<0.001*
Years in Practice										
Median Years (IQR)[a]	27	16(35)	15	5(29)	<0.001*	24	10(34)	19	8(31)	0.028*
CS Dispensing Behavior										
Median CS dispensed per day (IQR)[a]	40	22(60)	50	30(100)	<0.001*	50	25(75)	45	26(75)	0.391
Perceived Effectiveness of KASPER										
Reducing Drug Abuse and Diversion	176	88%	184	91%	0.219	148	86%	201	93%	0.042*
Reducing Doctor Shopping	172	86%	174	86%	0.675	149	86%	186	86%	0.734

* Denotes statistical significance at the 5% level. [a] IQR: Interquartile range

histories, the most common reason identified for not using KASPER was "I do not have Internet access to request KASPER reports at my practice site" (n=30). All pharmacists who indicated lack of Internet access as the primary barrier to using KASPER identified their practice type as chain pharmacy. Baseline characteristics and KASPER utilization for responding pharmacists by practice type (independent and chain) and practice location (rural and urban) are presented in Table 1.

A significant relationship was found in the bivariate comparison between use of KASPER and practice type, with a greater proportion of independent pharmacists having utilized KASPER (94%) than chain pharmacists (75%, p<0.001). Daily CS dispensing volume varied significantly with chain pharmacies dispensing more CS per day (median: 50, IQR: 30–100) than independent pharmacies (median: 40, interquartile range (IQR): 22–60, p=<0.001). Seventy percent (70%) of chain pharmacists stated they practiced in an urban location while only 38% of independent pharmacists indicated they practiced in an urban location (p<0.001). Responding pharmacists at independent pharmacies reported being licensed for more years (median: 27, IQR: 16–35) than chain pharmacists (median: 15, IQR: 5–29, p<0.001), respectively.

Bivariate comparisons revealed no significant association between practice location and KASPER use (p=0.878). Pharmacists in rural locations, compared to urban locations, were more likely to practice in an independent pharmacy (66% vs. 34%, p<0.001), and also reported being licensed for a longer period of time (median: 24, IQR: 10–34, median: 19, IQR: 8–31, p=0.037).

Responding pharmacists perceived KASPER as an effective tool to reduce drug abuse and diversion (92%; n=365) as well as doctor shopping (90%; n=350) in Kentucky. No difference in perceived effectiveness based on practice type was observed, however, a greater proportion of pharmacists in urban locations viewed KASPER as an effective tool to reduce drug abuse/diversion than pharmacists in rural locations (93% vs. 86%, p=0.041).

Multivariate Poisson Regression Model

Results from the Poisson regression model are presented in Table 2. Adjusted for the covariates listed in Table 2, community pharmacists in urban locations were 11% more likely to utilize KASPER than pharmacists in rural locations (p=0.032). After adjusting for the covariates, independent pharmacists were 27% more likely to utilize

Table 2. Predicting Community Pharmacist Use of KASPER (Poisson regression model)

Variables	Relative Risk	p-value	95%CI
Practice Location			
Rural	Ref		
Urban	1.11*	0.037	1.01-1.21
Practice Site			
Chain	Ref		
Independent	1.27*	<0.001	1.15 - 1.40
Years in Practice			
Years[a]	0.96*	0.050	0.93 - 1.00[c]
CS Dispensing Behavior			
CS Dispensed per Day[b]	1.00	0.297	1.00[c] - 1.01
Perceived PDMP Effectiveness Reducing Drug Abuse and Diversion			
Ineffective	Ref		
Effective	1.06	0.580	0.87 – 1.28
Perceived PDMP Effectiveness Reducing Doctor Shopping			
Ineffective	Ref		
Effective	1.12	0.224	0.93 – 1.36

*Denotes statistical significance at the 5% level
[a]Years was divided by 10 to show the impact of practicing an additional 10 years
[b]CS dispensed per day was divided by 10 to show the impact of dispensing an additional 10 CS per day
[c] Confidence interval includes 1.00 due to rounding
95%CI = 95% Confidence Interval

KASPER than chain pharmacists (p<0.001). A negative relationship was observed between the years since licensure and the likelihood of a pharmacist using KASPER (p=0.05). Neither CS dispensing volume nor perceived KASPER effectiveness influenced the likelihood of KASPER utilization.

DISCUSSION

Prescription drug monitoring programs have been implemented by states to address the prescription drug abuse crisis in the US. This study's purpose was to examine the association between characteristics of community pharmacists and pharmacists' practice environment with KASPER use, and determine if specific characteristics increased the likelihood of KASPER utilization. After controlling for confounding covariates, our multivariate results indicate that pharmacists who practiced in urban locations or at independent pharmacies were more likely to utilize KASPER than their counterparts in rural locations or chain pharmacies. The finding that urban pharmacists were more likely to utilize KASPER than rural pharmacists is somewhat surprising as prescription drug abuse is most prevalent in rural areas.[21-23] The high prevalence of prescription drug abuse in rural areas may also explain why the bivariate analysis found a lower proportion of rural pharmacists perceived KASPER as an effective tool to reduce drug abuse and diversion. However, pharmacists' perceptions concerning the effectiveness of KASPER did not impact the likelihood of utilization in the multivariate analysis.

Lack of Internet access was cited as the primary reason for not requesting a KASPER report and is consistent with previous surveys.[8,10] Considering that all responding pharmacists who indicated lack of Internet access as the primary reason for not using KASPER were chain pharmacists, it is not surprising that chain pharmacists were less likely to use KASPER. In fact, it is possible that this factor (i.e., lack of Internet access) may outweigh the impact of location and years-of-practice. Although not specifically addressed in this survey, workflow issues and corporate policies within chain pharmacies are likely different from those in pharmacies independently owned and operated. Thus, to increase PDMP utilization, other barriers in chain pharmacies should be explored.

The response rate of 27.9% is considered low, though consistent with other pharmacist surveys.[8,10,24] The study sample may not be representative of all community pharmacists in Kentucky as views of respondents may differ from non-responders and pharmacists familiar with KASPER may have been more inclined to participate. Due to the anonymous nature of the survey, comparisons of responders and non-responders were not possible. Additionally, the sample was limited to Kentucky community pharmacists and may not be generalizable to other states. This study analyzed a survey administered in 2009 and current KASPER utilization by Kentucky community pharmacists may have been impacted by improvements to the system, changes in corporate policies, and an increased awareness of the program. To protect anonymity extensive individual/pharmacist level questions (i.e. demographics) were not asked. Also, due to the cross-sectional design of this study an association between variables does not imply causality.

CONCLUSIONS

Utilization of KASPER at the point of dispensing varied significantly among community pharmacists and was influenced by characteristics of pharmacists' practice environment including practice type and practice location. For PDMPs to meet their objectives of curbing CS abuse and diversion, increased utilization of reports by healthcare professionals, including community pharmacists, for treatment decisions is warranted. Understanding characteristics associated with PDMP use may assist in developing strategies to remove barriers and increase utilization, thereby increasing the effectiveness of PDMPs.

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CONFLICT OF INTEREST

None declared.

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UTILIZACIÓN DEL PROGRAMA DE MONITORIZACIÓN DE LA PRESCRIPCIÓN DE MEDICAMENTOS EN LAS FARMACIAS COMUNITARIAS DE KENTUCKY

RESUMEN

Objetivo: Identificar las características de las farmacias comunitarias y del entorno de práctica de las farmacias comunitarias relacionadas con la utilización del Kentucky All Schedule Prescription Electronic Reporting Program (KASPER).

Métodos: Se enviaron cuestionarios a todos los 1.018 farmacéuticos con cuenta en el KASPER y a un total adicional de 1.000 farmacéuticos sin cuenta. Se examinó la asociación entre la utilización de KASPER y el tipo de ejercicio (independiente o de cadena) la localidad (rural o urbana) con análisis bivariado. Mediante un modelo de regresión multivariada de Poisson con varianza de error robusta se estimaron los ratios de riesgo (RR) de la utilización de KASPER con las características del entorno de práctica de los farmacéuticos.

Resultados: Se recibieron respuestas de 563 farmacéuticos (tasa de respuesta 27,9%). De esos, 402 respuestas de farmacéuticos comunitarios se incluyeron en el análisis. La mayoría de los respondentes (84%) indicó que ellos o alguien de su farmacia habían solicitado una historia de substancias controladas de un paciente desde que se creó KASPER. El análisis bivariado demostró que los farmacéuticos que ejercían en farmacias independientes comunicaban una mayor utilización de KASPER (94%) que los farmacéuticos de cadenas (75%; p<0,001). Los resultados de la regresión multivariada encontraron que la utilización de KASPER variaba significativamente entre los entornos de práctica de los farmacéuticos comunitarios que trabajaban en localidades urbanas (RR: 1,11; [1,01–1,21]) o los de farmacias independientes (RR: 1,27; [1,14–1,40]) que tenían una mayor probabilidad de utilización de KASPER.

Conclusión: La utilización de KASPER difiere en los ambientes de práctica de los farmacéuticos comunitarios, principalmente por tipo de establecimiento y localización. Es necesario entender las características de los farmacéuticos comunitarios y de los entornos de práctica de las farmacias comunitarias asociadas con el uso de programas de monitorización de la prescripción (PDMP) para eliminar las barreras de acceso y aumentar la utilización incrementando así la efectividad del PDMP.

Palabras clave: Detección de Abuso de Sustancias; Sistemas de Registro de Reacción Adversa a Medicamentos; Notificación Obligatoria; Servicios de farmacias comunitarias; Ejercicio profesional; Medicamentos bajo Prescripción; Estados Unidos

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