


Pharmacists Who Screen and Discuss Opioid Misuse With Patients: Future Directions for Research and Practice

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Abstract

Background: Prescription opioid (PO) abuse has reached epidemic proportions in the United States, and pharmacies are locations from which these medications are often diverted. This study identifies factors associated with pharmacists who currently screen and discuss PO misuse with patients. **Methods:** A secondary data analysis of a cross-sectional Web-based survey that was sent to pharmacists was conducted. The survey contained items that assessed whether pharmacists currently screened and discussed PO misuse with patients along with pharmacists' attitudes and beliefs toward providing brief interventions. Multivariable models were developed which identified factors associated with pharmacists' currently screening and discussing misuse. **Results:** Chain setting pharmacists (odds ratio [OR] = 6.16, 95% confidence interval [CI] = 1.16-32.72) and pharmacists interested in being directly involved in PO screening and brief intervention research projects (OR = 2.06, 95% CI = 1.35-3.15) were most likely to report current screening. Pharmacists who reported currently screening for misuse (OR = 4.27, 95% CI = 2.83-6.45) and who reported wanting to help patients who misuse POs (OR = 3.03, 95% CI = 1.50-6.15) were most likely to currently discuss abuse. **Conclusions:** Investigators implementing pharmacy-based screening and brief intervention studies for POs should take into account practice location and pharmacists' interest in addressing PO issues.

Keywords

prescription opioid abuse, pharmacy practice, screening and brief intervention

Introduction

Prescription opioid (PO) abuse in the United States has reached epidemic proportions.¹ Approximately 4.5 million individuals in the country reported misusing POs in 2011,² with 1.8 million persons being diagnosed as dependent (second only to marijuana dependence).² In 2008, approximately 40% of all illicit and prescription drug overdose deaths involved PO pain relievers.¹ Screening and brief intervention (SBI) has been developed, tested, and implemented in a number of health care settings to identify patients who misuse alcohol or drugs and then to provide brief counseling aimed at reducing use and preventing related risk behaviors.³⁻¹⁰ Specifically, SBI is a 15 to 30-minute behavioral health modality for health care providers to identify patients who abuse substances and discuss motivation for reducing or eliminating use. Included among the findings that support the efficacy of SBI is a study conducted by Zahradnik and colleagues which demonstrated reductions in PO misuse following the delivery of a brief intervention in an inpatient hospital setting.¹¹

In spite of this promising preliminary data for the efficacy of SBI for POs, little research has been done to examine SBI services in pharmacies for PO misuse. Pharmacists are well positioned to make significant contributions to improving the PO

misuse epidemic in the country, given that: (1) misused POs are often obtained at pharmacies^{12,13}; (2) pharmacists have regular contact with patients at risk or currently abusing, and (3) pharmacists are ranked among the most trusted professionals in the nation.¹⁴ Furthermore, Dhital and colleagues¹⁵ recently reported findings that showed the willingness of patients to address and receive written information in the pharmacy setting regarding at-risk alcohol use. Together, these facts demonstrate an opportune environment to deliver SBI. To identify how SBI for PO misuse might be received and implemented, we recently conducted a survey that examined pharmacists' attitudes toward addressing PO misuse and their interest in providing SBI.¹⁶ To do this, we surveyed pharmacists from a state with lower abuse and overdose rates, Texas, and those from a state

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with higher rates of abuse and overdose, Utah.^{17,18} The primary findings from this study indicated that despite differences in geographic location and in levels of abuse in each state, pharmacists were uniformly interested in helping patients with potential misuse problems and that SBI for PO misuse should be tested in pharmacies.¹⁶

Paradoxically, we also found that 45% of Texas pharmacists and 43% of Utah pharmacists reported currently screening for PO misuse. In addition, 57% of Texas pharmacists and 46% of Utah pharmacists reported currently discussing possible misuse with patients. This finding was not anticipated, given the fact that screening and discussing PO misuse are not currently required in either state^{19,20} and SBI or similar interventional methods are not endorsed practice behaviors from national pharmacy education or practice organizations. Thus, to explore in greater detail these findings regarding pharmacists screening and discussing misuse, the current secondary data analysis examined what factors were associated with Texas and Utah pharmacists' screening and discussing PO misuse with patients. By understanding what factors may influence screening and discussing PO misuse with patients, researchers and practitioners can better formulate and implement feasibility and effectiveness studies to assess the possibility of pharmacists delivering SBI for PO misuse.

Study Method

Sample

The parent study upon which the current secondary analysis is based was a cross-sectional Web-based survey that was administered to pharmacists in Texas and Utah. Texas survey recipients were pharmacist members of the Texas Pharmacy Association with e-mail addresses associated with their membership profiles. Utah survey recipients were licensed pharmacists with e-mail addresses associated with their state licensure records. Survey recipients received an e-mail message that introduced the investigators and gave a short explanation of the project (including a brief explanation of SBI). This introductory e-mail also indicated The University of Texas at Austin institutional review board approval (IRB) of the project along with the study identification number. Pharmacists who chose to complete the survey were directed to a cover letter for Internet research that contained a more in-depth explanation of the study, assurance of anonymity of their responses, an explanation of the investigators' intentions for the data, and the IRB approval and contact information. Following the initial e-mail invitation to participate in the survey, 3 follow-up e-mails were sent out over a 2-month period of time.

Survey Instrument

The survey instrument contained 37 items adapted by project investigators based on items from previously published surveys asking pharmacists about SBI for alcohol.^{21,22} The first 31 items in the survey were 5-point Likert-type scale statements (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree,

and 5 = strongly agree) with respect to pharmacist attitudes and barriers/motivators regarding: (1) working with those who misuse POs and (2) the possibility of SBI for those patients (see Appendix A for the 31 survey items and descriptive statistics). The Cronbach's α for all 31 items is 0.85. As can be seen in Appendix A, a brief explanation of SBI preceded questions asking about this service. Four additional items on the instrument asked gender, highest level of education, practice setting, and years of pharmacy practice experience. The survey also asked pharmacists: (1) Do you currently screen patients for prescription opioid misuse and (2) Do you currently discuss prescription opioid misuse with patients who may be involved in the activity? Although these 2 questions regarding screening and discussing misuse were not operationalized, as was SBI, within the questionnaire for survey participants, their general conceptual proximity to SBI supports investigation within the current analysis given this project's intent to better understand what factors may facilitate research and future practice within pharmacy settings in identifying and discussing PO misuse with patients.

Analyses

In the current study, Stata 12.1 was used to calculate descriptive statistics and to conduct the Hosmer and Lemeshow logistic regression model-building procedure.^{23,24} This procedure was utilized to develop 2 models that most correctly identified the individual survey items^{24,25} associated with pharmacists currently screening (yes screening and no screening [no screening as reference category]) patients for opioid misuse as well as currently discussing possible opioid misuse (yes discussing and no discussing [no discussing as reference category]). This model-building procedure was specifically selected in the current project, given that fact that the questions posed herein were not a priori to the original intent of the survey (which was pharmacist attitudes and knowledge toward SBI and PO misuse), and this study is the first of its kind with the pharmacy practice field. This item-level analysis provides the richest and clearest depiction of the individual factors associated with currently screening and discussing misuse. The results of this project will act as a base for future work aimed at understanding what factors influence pharmacists in screening and discussing PO misuse with patients. The 31 Likert items, gender (male and female [female as reference category]), highest level of education (bachelor's degree, master's degree, PharmD, and other [other as reference category]), practice setting (independent, chain, or health system setting, and other [other as reference category]), and state (Texas, Utah [Utah as reference category]) were incorporated as independent variables in the process of building the 2 logistic regression models. Current screening was also incorporated as an independent variable into the model predicting currently discussing misuse, given the possible temporal association between these 2 variables.

To establish the 2 models, the first step was to examine the linearity of the logit for the Likert-type scale items (considered as continuous variables) and years of practice.²⁴ Although no

issues were detected with years of practice, some Likert scaled items were not linear with the logit. To resolve this nonlinearity and to facilitate consistency in the analysis, the 31 Likert items were recoded into binary variables (1 = strongly agree and agree, 0 = strongly disagree, disagree, and neutral). The associations between these binary variables and the outcome indicators were modeled such that the affirmative indication (1 = strongly agree and agree) was interpreted with its relationship to the outcome variables, thus avoiding complications with the interpretation of the “strongly disagree, disagree, or neutral” category. The second step was to test the univariable relationships (ie, 1 independent variable and 1 dependent variable) between the individual outcome variables (currently screening and discussing misuse) and the individual independent variables using Wald chi-square (χ^2) statistics.²⁴ The third step involved entering the independent variables that were associated with the outcome variables ($P < .25$) into 2 baseline multivariable logistic regression models, one with current screening as the dependent variable and the other with currently discussing misuse as the dependent variable (ie, only a subset of moderately associated variables with $P < .25$ were entered into these models). The fourth step of the procedure included identifying the most parsimonious model for each dependent variable. To do this, items uncorrelated with the dependent variables ($P > .10$) were removed from the models.^{24,25} The coefficients of the variables retained in the model ($P \leq .10$) were analyzed and subsequently inspected to ensure that the removal of items did not result in drastic changes of beta magnitude. Following this, step 5 included considering interaction terms between the remaining independent variables within the models. No clinically meaningful or justifiable interactions were hypothesized. Therefore, the models that remained became the preliminary final models.²⁴ Finally, likelihood ratio comparisons between the baseline multivariable logistic regression models and the more parsimonious preliminary final models were carried out.^{24,25} With the absence of significant decrements in fit based on χ^2 likelihood ratio tests (LRT; currently screening for misuse model: LRT = 18.84, $df = 20$, $P = .533$; currently discussing misuse model: LRT = 16.52, $df = 17$, $P = .487$), the more parsimonious models were retained and constitute the final models presented herein.

Results

Respondents

E-mail survey invitations were sent to 2700 Texas pharmacists (with 297 messages returned as undeliverable) and to 1703 Utah pharmacists (with 161 messages returned as undeliverable). Of the 3945 pharmacists who presumably received invitations to participate in the survey, 739 responses were received (360 from Texas pharmacists and 379 from Utah pharmacists) resulting in a 19% response rate (a typical response rate for Web-based surveys of professional pharmacists²⁶⁻³²).

Table 1 shows the demographic and work differences for respondents based on whether or not the respondent currently

screened for PO misuse and whether or not respondents currently discussed possible PO misuse with patients. Pharmacists who currently screened for PO abuse (mean [M] = 21.2, standard deviation [SD] = 0.9) practiced approximately 3 years more than those who did not currently screen (M = 18.4, SD = 0.7; $t = -2.47$, $df = 617$, $P = .014$). In terms of currently discussing prescription misuse, a majority of pharmacists who currently discussed misuse also currently screened (62.2%, $\chi^2 = 94.2$, $df = 1$, $P < .001$). Moreover, a larger proportion of Texas (52.9%) pharmacists reported currently discussing misuse than those from Utah (47.1%, $\chi^2 = 7.3$, $df = 1$, $P = .007$). In addition, pharmacists who possessed a bachelor's level (54.8%) education were the largest group who reported currently discussing misuse and pharmacists with doctorate degrees (50.5%) were the largest group who did not currently discuss misuse ($\chi^2 = 9.8$, $df = 3$, $P = .02$). Chain pharmacists (38.3%) were the largest group who reported currently discussing misuse and health system pharmacists (43.1%) were the largest group who reported not currently discussing misuse ($\chi^2 = 29.5$, $df = 3$, $p < .001$). Overall, proportions of chain, independent, and health system pharmacists who completed the survey are similar to those practicing in the respective states.¹⁶ Finally, similar to screening for misuse, those who currently discussed misuse (M = 21.3, SD = 0.8) possessed approximately 3 years more practice experience than those who did not (M = 18.0, SD = 0.8; $t = -2.96$, $df = 616$, $P = .003$).

Final Model for Currently Screening for Misuse

Table 2 contains the survey items included in the final model that influenced current patient screening for possible PO medication misuse. Practicing in a chain pharmacy was the strongest predictor of currently screening, increasing odds more than 6-fold (odds ratio [OR] = 6.16, $\chi^2 = 2.13$, $P = .033$, 95% confidence interval [CI] = 1.16-32.72). Those pharmacists who were interested in being directly involved in research projects within their practice setting to identify patients who may misuse POs were more than 2 times as likely to currently screen (OR = 2.06, $\chi^2 = 3.34$, $P = .001$, 95% CI = 1.35-3.15) and those who indicated that electronic prescription record systems could be useful tools to identify possible misuse among patients were 75% more likely to currently screen (OR = 1.75, $\chi^2 = 2.12$, $P = .034$, 95% CI = 1.04-2.95). In contrast to increased odds in screening, pharmacists who reported that feeling awkward about asking patients regarding their PO misuse was a barrier to working with those who misuse were 58% less likely to currently screen (OR = 0.42, $\chi^2 = -4.20$, $P < .001$, 95% CI = 0.28-0.63). Further, those individuals who indicated that insufficient access to PO screening tools was a barrier to working with those who misuse were 44% less likely to report currently screening (OR = 0.56, $\chi^2 = -2.87$, $P < .004$, 95% CI = 0.38-0.83).

Final Model for Current Discussing Misuse

Table 3 contains the items that remained in the final model, which influenced currently discussing possible PO medication

Table 1. Demographic and Work Differences by Current Screening and Discussing Misuse.^a

Characteristic		Yes, n (%)	No, n (%)	χ^2 (df)	P
Currently screening					
State	Texas	144 (48.8)	176 (46.8)	0.27 (1)	.606
	Utah	151 (51.2)	200 (53.2)		
Gender	Male	185 (62.9)	209 (56.0)	3.23 (1)	.072
	Female	109 (37.1)	164 (44.0)		
Level of education	Bachelors	157 (54.3)	172 (46.7)	4.17 (3)	.240
	Masters	13 (4.5)	16 (4.4)		
	PharmD	117 (40.5)	178 (48.4)		
	Other	2 (0.7)	2 (0.5)		
Practice setting	Independent	80 (30.9)	91 (31.2)	6.26 (3)	.100
	Health system	72 (27.8)	102 (34.9)		
	Chain	104 (40.2)	92 (31.3)		
	Other	3 (1.16)	7 (2.4)		
Years practice experience ^b		21.2 (0.9)	18.4 (0.7)	-2.47 (617)	.014
Currently discussing					
Currently screening	Yes	214 (62.2)	81 (24.9)	94.2	<.001
	No	130 (37.8)	244 (75.1)		
State	Texas	182 (52.9)	138 (42.5)	7.3 (1)	.007
	Utah	162 (47.1)	187 (57.4)		
Gender	Male	208 (60.8)	186 (57.6)	0.7 (1)	.396
	Female	134 (39.2)	137 (42.4)		
Level of education	Bachelors	184 (54.8)	144 (45.1)	9.8 (3)	.020
	Masters	18 (5.4)	11 (3.45)		
	PharmD	133 (39.6)	161 (50.5)		
	Other	1 (0.3)	3 (0.9)		
Practice setting	Independent	113 (37.3)	58 (23.6)	29.5 (3)	<.001
	Health system	67 (22.1)	106 (43.1)		
	Chain	116 (38.3)	79 (32.1)		
	Other	7 (2.3)	3 (1.2)		
Years practice experience ^b		21.3 (0.8)	18 (0.8)	-2.96 (616)	.003

^a The proportional and mean demographic and work-related differences for study participants by self-reported current screening and discussing prescription opioid misuse.

^b Mean (standard deviation) and t value.

Table 2. Predictors of Currently Screening for Opioid Misuse.^a

Variable	OR	SE	Wald χ^2	P	95% CI
I have insufficient access to screening tools to assess PO misuse ^b	0.56	0.11	-2.87	.004	0.38-0.83
I have too few self-help or educational pamphlets available ^b	0.64	0.15	-1.91	.056	0.40-1.01
I feel awkward asking patients about their possible misuse of POs ^b	0.42	0.09	-4.20	<.001	0.28-0.63
I would be interested in being directly involved in carrying out a research project in my pharmacy to identify patients who misuse POs	2.06	0.45	3.34	.001	1.35-3.15
Electronic prescription records systems within pharmacies could be utilized as effective sources for identifying patients who might misuse POs	1.75	0.47	2.12	.034	1.04-2.95
I believe pharmacies may be good settings to test if brief interventions could help patients who misuse POs	0.72	0.15	-1.61	.107	0.48-1.07
Health system pharmacist	3.94	3.35	1.61	.108	0.74-20.91
Chain pharmacist	6.16	5.25	2.13	.033	1.16-32.72
Independent pharmacist	3.87	3.32	1.58	.115	0.72-20.77
Years of practice experience	1.02	0.01	2.46	.014	1.00-1.03
Male	1.34	0.28	1.42	.155	0.89-2.02

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error; PO, prescription opioid.

^a The final multivariate model of individual indicators associated with pharmacists who reported currently screening for prescription opioid misuse.

^b This statement was preceded in the survey by the stem: Please indicate your level of agreement as to whether or not the following might be barriers for you in working with patients who misuse prescription opioids.

Table 3. Predictors of Currently Discussing Opioid Misuse.^a

Variable	OR	SE	Wald χ^2	P	95% CI
If I had quick and easy screening questionnaires available ^b	0.56	0.14	-2.33	.020	0.34-0.91
I am too busy to do screenings ^c	0.74	0.16	-1.45	.148	0.49-1.12
I possess too little training in helping patients who misuse POs ^c	0.42	0.10	-3.83	<.001	0.27-0.65
I have insufficient access to screening tools to assess PO misuse ^c	1.40	0.30	1.56	.119	0.92-2.15
My patients believe that I have the right to ask them about their use of POs	1.88	0.42	2.80	.005	1.21-2.93
I want to help patients who misuse POs	3.03	1.09	3.08	.002	1.50-6.15
I feel I have the right to ask patients about their use of POs	2.14	0.72	2.28	.022	1.11-4.12
Currently screens for PO abuse	4.27	0.90	6.90	<.001	2.83-6.45
Health system pharmacist	0.15	0.12	-2.45	.014	0.03-0.69
Chain pharmacist	0.41	0.31	-1.17	.241	0.09-1.82
Independent pharmacist	0.52	0.40	-0.85	.396	0.12-2.34

Abbreviations: CI, confidence interval; OR, odds ratio; SE, standard error; PO, prescription opioid.

^a The final multivariate model of individual indicators associated with pharmacists who reported currently discussing prescription opioid misuse with patients.

^b This statement was preceded in the survey by the stem: Please indicate your level of agreement as to whether or not the following might be motivators for you in working with patients who misuse prescription opioids.

^c This statement was preceded in the survey by the stem: Please indicate your level of agreement as to whether or not the following might be barriers for you in working with patients who misuse prescription opioids.

abuse with patients. Currently screening increased the odds of a pharmacist discussing opioid misuse by more than 4-fold (OR = 4.27, $\chi^2 = 6.90$, $P < .001$, 95% CI = 2.83-6.45). In addition, those practitioners who reported wanting to help patients who misuse were more than 3 times as likely to currently discuss current misuse (OR = 3.03, $\chi^2 = 3.08$, $P = .002$, 95% CI = 1.50-6.15). Those pharmacists who felt they had the right to ask patients about their use of POs were more than 2 times as likely to currently discuss misuse (OR = 2.14, $\chi^2 = 2.28$, $P = .022$, 95% CI = 1.11-4.12) and those who reported that their patients believed that pharmacists have the right to ask about their PO use were 88% more likely to currently discuss misuse (OR = 1.88, $\chi^2 = 2.80$, $P = .005$, 95% CI = 1.21-2.93). In contrast to increased odds, practicing in a health system decreased the likelihood of currently discussing misuse by 85% (OR = 0.15, $\chi^2 = -2.45$, $P = .014$, 95% CI = 0.03-0.69). Also, pharmacists who indicated too little training was a barrier to working with individuals who misuse prescription medications (OR = 0.42, $\chi^2 = -3.83$, $P < .001$, 95% CI = 0.27-0.65) and those who reported that possessing quick and easy screening questionnaires would motivate them to work with patients who misuse (OR = 0.56, $\chi^2 = -2.33$, $P = .02$, 95% CI = 0.34-0.91), both had lower odds of currently discussing misuse.

Discussion

This secondary data analysis has shown that specific attitudes and characteristics are associated with pharmacists screening and discussing PO misuse with patients. Possessing an understanding of the relationships between these factors and the likelihood of providing this service may be helpful for planning and implementing studies to examine the feasibility and effectiveness of pharmacy-based SBI for PO misuse. If the feasibility and effectiveness of SBI for PO misuse are subsequently empirically established, then the findings from the current

analysis would also have implications for pharmacy practice, education, and training.

Implications for Research

In terms of future research to test SBI in pharmacies for PO misuse, it may be important for researchers to consider the location in which such studies are conducted. It appears that chain settings could be promising locations for screening projects in light of the increased odds for screening in these locations; however, it is not clear whether the same advantages could be expected for interventions (ie, discussing misuse) in chain settings. These increased odds for screening could be related to the fact that chain setting pharmacists likely encounter individuals seeking PO medications on a more regular basis, given the location of these pharmacies within communities and the marketplace. On the other hand, it appears that health system pharmacies may be less viable for intervention provision. Lower levels of discussing PO misuse could be rooted in the fact that health system pharmacies are often situated within hospitals or other locations where patients typically do not seek to obtain these drugs on an outpatient basis. Likewise, health system pharmacy patients may be more likely to have multiple chronic conditions for which they are seeking a variety of prescriptions that, altogether, do not present a clear case for concern of PO medication abuse. If health system pharmacies are considered for SBI PO research studies, it may be beneficial for researchers to ensure that they are in locations visible and accessible to the public and that all patients with opioid prescriptions be systematically screened.

Practice setting is not the only factor that could influence the feasibility of future research. Studies that aim to test PO SBI may also consider the years of practice experience pharmacists possess along with their orientation toward helping those who misuse POs. More senior pharmacists who believe it is their responsibility or those pharmacists who believe patients see it

as pharmacists' responsibility to inquire about PO use reported being more likely to discuss PO misuse. Furthermore, those practitioners who reported actively screening were 4 times more likely than their colleagues to discuss misuse. A study in an environment wherein pharmacists already are thinking and talking about PO misuse would likely have greater acceptability or feasibility. However, researchers may also be cautious in deploying research in such environments, as pharmacists who are actively screening and discussing misuse because they believe it is part of their practice could be resistant to changes (eg, based on study protocol) to the services they are providing.

In contrast, pharmacists who were less likely to screen reported that limited access to screening tools would inhibit their engagement in delivering SBI services. Furthermore, a seemingly contradictory finding from the analysis could be the lower rates of currently discussing misuse reported by pharmacists who indicated having quick and easy screening tools available would be a facilitator to working with those who misuse POs. This finding, however, may not be contradictory when considering the fact that those pharmacists who want quick and easy tools may be those who currently have less time to work with patients on any level. As a consequence, if they actually possessed quick and easy tools, rates of discussing would likely increase; however, until those resources are available, rates of discussing would be low as was found herein. Therefore, based on this finding, it would be helpful for researchers to plan to employ brief screening tools that are easy for pharmacists to access. Coupling these findings with the increased odds for screening among practitioners who viewed electronic prescription record systems as potentially effective resources to identify those at risk of PO misuse, researchers may consider developing data-centered algorithms for identifying abuse. Such systems could not only alert pharmacists to patients currently abusing but pharmacists could also be notified of the patients who have risk behaviors predictive of future abuse.

In addition to patient identification, practitioners who reported feeling awkward and not possessing sufficient training as barriers to helping those who misuse POs were less likely to screen and discuss misuse. Given these findings, it seems important for researchers to provide ample training and supervision to pharmacists delivering SBI services within research studies. For instance, pharmacists providing study interventions would benefit from didactic and simulated face-to-face patient interactions followed by feedback on actual patient sessions. Alternatively, other approaches for screening and interventions could be to employ a behavioral health specialist delivery model or computer-/Web-based SBI programs. Electronic interventions would likely dovetail well with computer-based screening tools from a methodological perspective as well as possibly enhancing patient privacy and pharmacist reach outside of the pharmacy.³³

From Research to Provision of SBI Services

If future research studies were able to support the effectiveness of pharmacy-based SBI services, the findings in the current

analysis could also prove helpful in the broader establishment of SBI in pharmacies. For instance, pharmacists who reported screening and discussing misuse possessed more years of practice experience and practitioners who want to help and view asking about PO misuse as their responsibility had increased odds of currently screening. Together, these facts suggest proponents for these services exist within pharmacies. Such leadership could be organized not only to conduct and disseminate research findings, but moreover, these pharmacists could also help garner support for SBI services from education/training programs and national pharmacy groups. For instance, Screening, Brief Intervention, and Referral to Treatment (SBIRT) residency training programs have been funded for a number of years by the Substance Abuse and Mental Health Services Administration.³⁴ Similar opportunities could be useful for pharmacy students and residents. Additionally, as occurred for SBI in trauma and primary care settings,³⁵ empirical evidence effectively disseminated could catalyze practice and policy endorsements at the national level for the delivery of this service within pharmacy settings.

In addition to leadership that likely would constitute early adopters of SBI in the pharmacy setting, the results from the current study also provide insight into what factors would promote and facilitate SBI implementation among pharmacists who have reservations about this service. As was mentioned, pharmacists who were less likely to screen reported that limited access to screening tools would inhibit their engagement in delivering SBI services and those who reported not possessing sufficient training as barriers to helping those who misuse POs were less likely to screen and discuss misuse. Therefore, as validated brief screening tools can be developed for the PO misusing population-seeking services in the pharmacy setting, it will be critical to (1) have broad dissemination of these measures through easily accessible sources, such as the Web, and (2) ensure training on such tools is also easily available or possibly required. Although screening in and of itself is not a guarantor that pharmacists will subsequently discuss PO misuse, the findings from this study show that currently screening increases the odds of a pharmacist discussing misuse 4-fold. Therefore, active screening appears to have a possible windfall effect in further engaging patients.

Limitations

This study possesses several strengths that include its sample size that permitted a robust analysis and its inclusion of 2 states with differing severities of PO misuse and overdose. Despite these strengths, the survey response rate was somewhat low. As a consequence, the results may only represent a portion of pharmacists' perspectives in either state. Likewise, different sampling lists were utilized to identify and e-mail participants (ie, Texas's list was comprised of pharmacist members of the Texas Pharmacy Association, and Utah's list was from state licensure records). In spite of these possible limitations, it does not appear that the study results were driven by respondents from 1 particular state over another, given the absence of

significant effects for state in the final logistic regression models. Furthermore, had clustering effects been requested in the model to account for state-level influences, these would not have changed the point (OR) estimates. This finding was consistent with the main outcome analyses published previously which showed consistent similarities in scores for each state between individual factor constructs.¹⁶

In addition to possible biases introduced by the study sample, due to the fact that this survey was a secondary analysis, the survey instrument was not specifically designed to answer the research question. Although the items included within the final logistic regression models are illustrative of attitudes and characteristics associated with pharmacist screening and discussing PO misuse, other items not included in the current survey could have added to the current analysis and results. In a similar vein, a possible concern could exist regarding multicollinearity of the items included within multivariate models developed herein due to overlap between thematic constructs. However, given the absence of extremely large point estimates and standard errors for the model predictors, we feel confident that the survey items included within the models represent independent beliefs and attitudes. Furthermore, given the fact that the question answered in the current study was not a priori to the original intent of the survey itself (which was pharmacist attitudes and knowledge toward SBI and PO misuse), we specifically chose to employ the Hosmer and Lemshow's model-

building procedure. The results of utilizing this procedure for analyzing the data and developing the models herein provide much needed data within the field regarding the individual factors that influence pharmacists screening and discussing PO misuse with patients. These results will act as a base for future research to understand pharmacists' efforts related to screening and discussing PO misuse. Notwithstanding these limitations, the current study provides a first glimpse into beliefs and attitudes of pharmacists that are associated with screening and discussing PO misuse with patients.

Conclusions

PO misuse has reached epidemic proportions in the United States, with pharmacies being key locations to obtain these drugs for diversion and abuse. Preliminary evidence from other health care settings indicates that brief interventions can have an important influence on reducing medication abuse, including the misuse of POs.^{11,36} Engagement by pharmacists in SBI service delivery may help to reduce PO misuse and improve public health. Some Texas and Utah pharmacists are currently engaged in screening activities and discussing possible PO misuse. By understanding the factors associated with pharmacist screening and discussing PO misuse, researchers may be able to better formulate feasibility and effectiveness studies to test pharmacy-based SBI for PO misuse.

Appendix A

Survey Instrument Descriptive Statistics

Survey Question	Strongly disagree	Disagree	Neutral % of n	Agree	Strongly agree	n
I feel I have a working knowledge of prescription opioid misuse	0.7	1.5	6.0	62.9	29.0	738
I feel I have a clear idea of my responsibilities in helping patients who misuse prescription opioids	1.0	10.3	21.2	49.2	18.3	736
I feel I do not benefit from trying to help patients who misuse prescription opioids	15.0	47.3	17.3	14.1	6.3	735
I feel that there is little I can do to help patients who misuse prescription opioids	11.7	41.8	19.0	23.9	3.5	736
I feel I have the right to ask patients about their use of prescription opioids	0.5	3.0	8.6	54.4	33.4	730
My patients believe that I have the right to ask them about their use of prescription opioids	12.3	29.2	28.1	27.7	2.7	733
I want to help patients who misuse prescription opioids	0.0	0.8	9.4	59.3	30.4	733
In general, it is rewarding to help patients who misuse prescription opioids	1.4	9.6	22.3	46.1	20.7	731
I would be interested in being directly involved in carrying out a research project in my pharmacy to identify patients who misuse prescription opioids	8.1	21.5	39.0	23.6	7.7	715
I would be willing to allow a research project to happen in my pharmacy to identify patients who misuse prescription opioids, but I would not be interested in being directly involved in a project	10.1	25.4	46.3	14.7	3.4	712
Patients in my pharmacy would probably not mind being contacted about their use of prescription opioids, if their use was assessed to be risky or harmful	21.0	44.8	26.7	6.8	0.7	719
Electronic prescription record systems within pharmacies could be utilized as effective sources for identifying patients who might misuse prescription opioids	1.9	5.2	9.1	56.6	27.2	728
Patients who misuse prescription opioids would respond better to computer-based questionnaires that screen for prescription opioid misuse than to face-to-face screening	3.3	23.0	27.6	39.0	7.0	725
I believe pharmacies may be good settings to test if brief interventions (15-minute conversations about possibly changing substance abuse behaviors) could help patients who misuse prescription opioids	3.5	16.7	26.8	46.3	6.6	723
Patients who misuse prescription opioids would respond better to a computer-based interactive brief intervention (such as one with written information and prerecorded advice) than to face-to-face interventions	3.7	26.6	31.8	32.0	5.9	726
I possess too little training in helping patients who misuse prescription opioids	7.3	37.7	21.3	31.6	2.1	681
I am too busy to do screenings	2.1	23.7	28.6	34.7	10.9	678
I have insufficient access to screening tools to assess prescription opioid misuse	2.8	25.9	21.3	44.5	5.5	676
I know too little about how to identify patients who misuse prescription opioids when they do not have obvious symptoms of excess opioid use	7.2	41.8	22.4	27.0	1.6	679
I am too busy to provide brief interventions (15-minute conversations about possibly changing substance abuse behaviors)	2.4	24.0	26.7	35.0	11.9	678
I have too few self-help or educational pamphlets available.	0.7	6.1	19.4	58.7	15.1	675
I believe patients would not take my advice.	2.4	29.6	30.3	29.9	7.8	676
I believe patients in my care would not change their behaviors	0.9	23.0	34.7	33.4	8.0	677
I feel awkward asking patients about their possible misuse of prescription opioids	4.7	38.6	18.3	32.8	5.6	677
I believe patients would resent being asked about their possible misuse of prescription opioids	0.7	8.4	16.9	55.4	18.6	681
I believe screenings and brief interventions (15-minute conversations about possibly changing substance abuse behaviors) are not what I should be doing as a pharmacist	14.0	49.3	27.6	7.1	2.1	680
I know too little about where to refer patients for help	4.3	20.0	17.5	50.5	7.8	681
If I had referrals to treatment services readily available for patients.	0.1	2.1	14.8	68.3	14.6	676
If I had quick and easy intervention techniques available	0.3	2.8	15.7	69.1	12.0	674
The positive impact I could have in helping patients who may misuse prescription opioids	0.0	1.6	16.3	64.8	17.3	676

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