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Pharmacists' knowledge, attitudes and beliefs regarding screening and brief intervention for prescription opioid abuse: a survey of Utah and Texas pharmacists

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Abstract

Background In the USA prescription opioids, which are misused or abused by some patients, are often obtained from pharmacies. However, screening and brief intervention (SBI) for prescription opioid misuse has not been tested in this setting. The goal of this project was to assess pharmacists' attitudes and motivation towards delivering SBI for prescription opioid abuse.

Methods A descriptive cross-sectional online survey was administered to pharmacists in Utah and Texas, USA. The survey assessed pharmacists': (1) interest in addressing prescription opioid abuse; (2) beliefs about whether pharmacies may be effective locations to deliver SBI; and (3) potential education or training needs to facilitate SBI service delivery.

Results A total of 739 pharmacists responded to the survey. Despite demographic differences, responses to the survey items were similar between Utah and Texas. The highest levels of agreement for survey subscales indicated that: (1) screening and intervention resources would increase pharmacists' motivation to deliver SBI; (2) pharmacists were interested in helping patients who misuse; and (3) pharmacists possess sufficient opioid knowledge and confidence in practice to address prescription abuse. Roughly half of pharmacists that responded agreed that SBI is a service they should deliver.

Conclusion Pharmacists are interested in helping those who misuse prescription opioids and believe pharmacies may be settings in which SBI services can be tested and delivered. These results require replication to assess if they portray pharmacists' views generally. If replicated, future research could examine methods of screening and intervention in the pharmacy setting for prescription opioid misuse.

Keywords pharmacy; prescription opioids; screening and brief intervention

Introduction

Prescription painkiller abuse is reaching epidemic proportions in the USA.[1] In 2007, approximately 5.2 million people reported using pain relievers for non-medical purposes.[2] The prevalence of prescription painkiller abuse is second only to marijuana use in the country.[3] A number of individual problems result as a consequence of the misuse of prescription painkillers – with the most serious being the potential of overdose death. Of the 36 450 drug overdose deaths that occurred in 2008 in the USA, 14 800 (41%) were overdoses involving opioid pain relievers.[1] These levels of abuse and overdoses have prompted a number of responses aimed at addressing prescription opioid misuse. Responses have included anti-diversion strategies, monitoring systems, tamperproof prescription pads and punitive laws for misuse.[4–7] Although some aspects of these efforts have proven beneficial,[6] the problem is far from resolved and prescription opioid abuse continues to take an increasingly heavy toll in the nation.[8] Because of these shortcomings, additional avenues to address this problem must be considered.

Screening and brief intervention (SBI) is an evidence-based approach that healthcare providers can utilize to identify patients with substance abuse issues and subsequently to explore patients' motivation and interest in changing behaviours.[9–13] The SBI typically involves screening patients for at-risk drinking by using self-report or blood alcohol content measures followed by a 15–30-min one- or two-session intervention delivered by clinicians for those who are positive. Several studies have shown evidence that SBI for alcohol is

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effective when delivered in in-patient, emergency and trauma-care settings.[9–13] Brief interventions in healthcare settings have demonstrated initial promise for reducing prescription medication misuse. For instance, one study showed that a brief behavioural invention with chronic back pain patients in a primary care setting significantly reduced non-compliant opiate use.[14] Another study demonstrated that a brief intervention could produce significant reductions for prescription opiate and hypnotic/sedative use among patients in a general hospital setting.[15]

In spite of these preliminary indications of success for SBI in reducing prescription opioid misuse in healthcare settings, pharmacies have not been locations in which SBI services have been tested. In the USA, prescription opioids, which are misused or abused by some patients, are often obtained from pharmacies.[16,17] Pharmacies, particularly health system and chain settings, also house prescription record systems that possess detailed medication histories and prescription filling patterns for patients, including those who are at-risk or currently misuse.[18,19] Furthermore, pharmacists across the country have access to Prescription Drug Monitoring Programs (PDMPs), which provide necessary information to clinicians in order to curb medication misuse.[6] In fact, using electronic prescription record systems for identifying patients misusing medications has been successfully employed in previous behavioural health intervention studies.[20]

Given the (1) the prevalence of prescription opioid misuse, (2) positive preliminary indications for SBI addressing prescription opioid abuse, and (3) important role pharmacies play for access to prescription opioids and for information about those who misuse, delivering SBI in pharmacies for prescription opioid abuse is a promising possibility for addressing this serious public health issue. Therefore, the goal of the current study was to examine pharmacists' interest, beliefs and opinions about prescription opioid abuse and SBI. Further, this study sought to examine if pharmacists' views towards prescription opioid misuse and SBI differed between a US state with severe levels of opioid abuse and a state with less severe problems. Specifically, pharmacists in Utah and Texas were targeted in this project. Utah pharmacists were selected because of this state's rate of prescription drug overdoses being fourth highest in the nation,[21] and its rate of non-medical use of pain relievers being highest in the nation.[22] Pharmacists in Texas were selected as recipients for the survey because of the state's moderate[21] but increasing levels of prescription opioid abuse, treatment seeking and overdoses,[23,24] ranking 35th in misuse[22] and 43rd in overdoses.[21] Both states were also selected because of the research team's access to pharmacists' contact information.

Specifically, this project explored: (1) pharmacists' level of interest in addressing prescription opioid abuse; (2) pharmacists' beliefs regarding whether pharmacies might be effective settings to address prescription opioid abuse through SBI; and (3) pharmacists' opinions on the education and training that would be needed for them to become further engaged in SBI activities for prescription opioid misuse. Assessing pharmacists' interest, beliefs and opinions about prescription opioid abuse and SBI is a necessary first step in understanding how brief interventions for opioid misuse might be effectively applied in the pharmacy setting.[25,26]

Methods

Sample

A cross-sectional internet-based survey was administered to pharmacists in Utah and Texas using a Select SurveyMonkey plan (www.SurveyMonkey.com). All Utah pharmacists with e-mail addresses associated with their licences were invited to participate in the survey. Pharmacist members of the Texas Pharmacy Association with e-mail addresses associated with their membership profiles were also invited to participate in the survey. Survey recipients received an e-mail message introducing the project investigators and giving a short explanation of the project with an invitation to click on a link to the survey. This introductory e-mail also included an explanation of the study's institutional review board (IRB) review and approval from The University of Texas at Austin. Those pharmacists who chose to click the link 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 and an explanation of what investigators intended to do with the data. This more in-depth explanation of the study also included the IRB approval and contact information. At the end of this cover letter, participants were invited to proceed to the survey. Following the initial invitation to participate in the survey, three follow up e-mails were sent over 3 months. Follow up e-mails thanked those who had completed the survey and encouraged the others to respond.

Survey instrument and item analysis

The survey consisted of 37 closed-ended items that were adapted from previously published surveys asking pharmacists about SBI for alcohol misuse[25,26] or were developed by project investigators. The adaptations made to the original survey items selected for the current questionnaire included: (1) changing 'alcohol' to 'opioids' for those questions that used the word alcohol and (2) a simplification of language (see original surveys for comparisons[25,26]). Because no prior studies had examined SBI for opioid misuse among pharmacists, the investigators added items covering areas such as interest in research involvement and electronic prescription records. The first 31 items of the survey were five-point Likert-scale response statements (one = strongly disagree, two = disagree, three = neutral, four = agree and five = strongly agree). Likert-scale items asked respondents to rate their level of agreement with statements about prescription opioid abuse and the potential of SBI. The final six items requested demographic and work-related information. Descriptive statistics, *t*-tests and χ^2 tests with odds ratios were carried out to examine demographic and work related differences.

To facilitate reporting results for the 31 Likert-scale items, we performed an exploratory principal components analysis (PCA) with Varimax rotation. Eigenvalues over 1.0 and Scree plots were used to identify the number of factors in the solution, and rotated component matrix values greater than 0.4 were used to identify items that loaded onto specific factors. To assess reliability, we calculated Cronbach's α for each subscale. Individual subscale values were calculated by averaging the scores for items that loaded onto a single factor (six statements were reverse coded to reflect positive opinions

within subscales). Averaging the item scores for the subscales allowed the factor means to remain on the same one (strongly disagree) to five (strongly agree) scale. *T*-tests and analysis of variance (ANOVA) analyses with the Bonferroni correction were used to examine mean differences in the scale items, and Pearson correlations allowed us to examine the relationships between years of pharmacy practice and the subscales. All statistical analyses were conducted using IBM SPSS software (version 19.0, Chicago, Illinois, USA).[27]

Results

Response rate and demographics

A total of 1703 Utah pharmacists and 2700 Texas pharmacists were e-mailed and invited to participate in the survey, with 161 Utah emails and 297 Texas e-mails returned as undeliverable. Therefore, 1542 Utah pharmacists and 2403 Texas pharmacists received e-mails, totalling 3945 recipients. Of those who received e-mails, Utah pharmacists completed 379 (Utah response rate: 24.6%) and Texas pharmacists completed 360 (Texas response rate: 15%), a total of 739 respondents with a 19% response rate.

Table 1 contains the demographic information for survey respondents. More respondents were male (Utah $n = 207$, 58.5%; Texas $n = 189$, 59.2%). There was a significant difference ($\chi^2 = 110.02$, difference test (df) = 3, $P < 0.01$) between pharmacists' level of education. Doctorate level pharmacists (PharmD) were over-represented in the Utah sample ($n = 223$, 63.2%, standardized residual (SR) = 5.2) and Bachelor's level pharmacists (BSPharm) were over-represented in the Texas sample ($n = 218$, 70.3%, SR = 5.0). A significant difference ($\chi^2 = 83.02$, df = 3, $P < 0.01$) was also detected for practice location. Utah health system pharmacists were over-represented in the data ($n = 135$, 45.6%, SR = 4.2), and Texas independent pharmacists were over-represented in the sample ($n = 123$, 47.5%, SR = 4.7). Despite this significant difference for practice setting, these proportions of pharmacists working in health system, chain and independent settings are generally reflective of actual distributions within the respective states.[28,29] Lastly, Utah pharmacists (mean (M) = 13, standard deviation (SD) = 11.2) reported having been in practice significantly fewer years as pharmacists than those from Texas (M = 27, SD = 13.8; $t = –6.73$, df = 605.3, $P < 0.01$).

Items and factors

The statements to which the two largest proportions of respondents 'strongly agreed' were: 'I feel I have the right to ask patients about their use of prescription opioids' (33.4%) and 'I want to help patients who misuse prescription opioids' (30.4%). The statements to which the two largest proportions of respondents 'agreed' indicated that pharmacists' engagement in SBI would be increased: 'If [they] had quick and easy intervention techniques available' (69.1%) and 'If [they] had referrals to treatment services readily available for patients' (68.3%). The statement to which the largest proportion of respondents 'strongly disagreed' was: '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%). The second largest proportion of respondents 'strongly disagreed' (18.6%) and the largest proportion of respondents 'disagreed' (55.4%) with the item that stated: 'I believe patients would resent being asked about their possible misuse of prescription opioids'. The statement to which the second largest proportion of respondents 'disagreed' was: 'I believe screenings and brief interventions are *not* what I should be doing as a pharmacist' (49.3%). For the one item not retained in a subscale, 50.2% of respondents 'agreed' or 'strongly agreed' that '. . . pharmacies may be good settings to test if brief interventions could help patients who misuse prescription opioids.'

Sampling adequacy (0.83) and the χ^2 test of sphericity ($\chi^2 = 6331.6$, df = 465, $P < 0.001$) supported the PCA solution. Eight factors emerged from the data, with one item that did not load onto any factor (see Table 2 for reliability scores, factor loadings, proportion of item endorsement and total number of responses to the items). The eight-factor solution explained 59.9% of the total variance. The subscales were named: (1) *motivators to service* (comprised of statements about tools and attitudes that would motivate pharmacists to engage in SBI practice); (2) *patient reactions* (comprised of statements about how patients may react to SBI and possibly

Table 1 Demographic characteristics and differences between Utah and Texas

Variable		Utah		SR	Texas		SR	(df)	*P*
		n	%		*n*	%			
Gender	Female	147	41.5	0.1	130	40.8	–0.1	0.04 (1)[a]	0.84
	Male	207	58.5	–0.1	189	59.2	0.1		
Level of education	Bachelors	114	32.3	–4.7	218	70.3	5.0	110.02 (3)[a]	≤0.01
	Masters	12	3.4	–1.0	18	5.8	1.1		
	DPharm	223	63.2	5.2	74	23.9	–5.5		
	Other	4	1.1	1.3	0	0.0	–1.4		
Practice location	Health system	135	45.6	4.2	41	15.8	–4.5	83.02 (3)[a]	≤0.01
	Chain	103	34.8	–0.1	93	35.9	0.2		
	Independent	50	16.9	–4.4	123	47.5	4.7		
	Other	8	2.7	1.2	2	0.8	–1.2		
Years as a pharmacist[b]		13	11.2	–	27	13.8	–	–6.73 (605.3)[c]	≤0.01

[a]χ^2 test, [b]means and standard deviations, [c]*t*-test. df, difference test; SR, standardized residual.

Table 2 Factors and individual items

Factor	α	Factor loading	Survey question	% of *n*					*N*
				Strongly disagree	Disagree	Neutral	Agree	Strongly agree	
Motivators to service[a]	0.86	0.80	If I had referrals to treatment services readily available for patients.	0.1	2.1	14.8	68.3	14.6	676
		0.85	If I had quick and easy screening questionnaires available.	0.1	5.5	17.8	65.3	11.3	674
		0.88	If I had quick and easy intervention techniques available.	0.3	2.8	15.7	69.1	12.0	674
		0.70	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
Patient reactions	0.73	–0.67	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
		–0.59	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
		0.59	I believe patients would not take my advice.[b]	7.8	29.9	30.3	29.6	2.4	676
		0.57	I believe patients in my care would not change their behaviours.[b]	8.0	33.4	34.7	23.0	0.9	677
		0.70	I believe patients would resent being asked about their possible misuse of prescription opioids.[b]	18.6	55.4	16.9	8.4	0.7	681
Barriers to service	0.72	0.63	I possess too little training in helping patients who misuse prescription opioids.	7.3	37.7	21.3	31.6	2.1	681
		0.62	I have insufficient access to screening tools to assess prescription opioid misuse.	2.8	25.9	21.3	44.5	5.5	676
		0.61	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
		0.63	I have too few self-help or educational pamphlets available.	0.7	6.1	19.4	58.7	15.1	675
		0.74	I know too little about where to refer patients for help.	4.3	20.0	17.5	50.5	7.8	681
Attitudes towards helping	0.68	0.67	I feel I do not benefit from trying to help patients who misuse prescription opioids.[b]	6.3	14.1	17.3	47.3	15.0	735
		0.58	I feel that there is little I can do to help patients who misuse prescription opioids.[b]	3.5	23.9	19.0	41.8	11.7	736
		–0.66	I want to help patients who misuse prescription opioids.	0.0	0.8	9.4	59.3	30.4	733
		–0.67	In general, it is rewarding to help patients who misuse prescription opioids.	1.4	9.6	22.3	46.1	20.7	731
Opiates and practice	0.66	0.72	I feel I have a working knowledge of prescription opioid misuse.	0.7	1.5	6.0	62.9	29.0	738
		0.69	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
		0.67	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
		0.44	I feel awkward asking patients about their possible misuse of prescription opioids.[b]	5.6	32.8	18.3	38.6	4.7	677
Priority and time	0.70	0.85	I am too busy to do screenings.	2.1	23.7	28.6	34.7	10.9	678
		0.86	I am too busy to provide brief interventions (15 min conversations about possibly changing substance abuse behaviours).	2.4	24.0	26.7	35.0	11.9	678
		0.41	I believe screenings and brief interventions (15 min conversations about possibly changing substance abuse behaviours) are not what I should be doing as a pharmacist.	14.0	49.3	27.6	7.1	2.1	680
Research	0.52	0.70	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
		0.74	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
		0.47	Electronic prescription records 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
Service delivery	0.74	0.87	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
		0.88	Patients who misuse prescription opioids would respond better to a computer-based interactive brief intervention (such as one with written information and pre-recorded advice) than to face-to-face interventions.	5.9	32.0	31.8	26.6	3.7	726
Item not retained	N/A	–0.37	I believe pharmacies may be good settings to test if brief interventions (15 min conversations about possibly changing substance abuse behaviours) could help patients who misuse prescription opioids.	3.5	16.7	26.8	46.3	6.6	723

[a]In the survey instrument, these items were preceded by the following statement: '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.' [b]Item reverse coded. NA, not applicable.

Table 3 *T*-test differences for survey subscales by state

	M combined	SD	M Utah	SD	M Texas	SD	*t*-test	df	*P*
Motivators to service ($n = 669$)	3.9	0.5	3.9	0.5	3.9	0.6	0.69	667	0.49
Patient reactions ($n = 661$)	2.6	0.7	2.6	0.7	2.5	0.6	−1.16	659	0.25
Barriers to service ($n = 668$)	3.2	0.7	3.2	0.7	3.2	0.7	0.73	666	0.46
Attitudes towards helping ($n = 724$)	3.7	0.7	3.7	0.7	3.7	0.7	1.84	722	0.07
Opioids and practice ($n = 669$)	3.8	0.6	3.7	0.6	3.9	0.6	4.19	667	≤0.01
Priority and time ($n = 674$)	3.0	0.8	3.0	0.7	3.0	0.8	−0.78	629	0.44
Research ($n = 706$)	3.3	0.7	3.3	0.6	3.2	0.7	−1.13	704	0.26
SBI Delivery ($n = 721$)	3.1	0.9	3.1	0.9	3.0	0.9	−1.38	719	0.17

Utah: $n = 379$; Texas: $n = 360$. df, difference test; M, mean; SD, standard deviation.

Table 4 One-way analysis of variance analyses for survey subscales by workplace

Subscale	Health system		Chain		Independent		*P*
	M	SD	M	SD	M	SD	
Motivators to service ($n = 535$)	3.9	0.6	3.9	0.6	3.9	0.5	0.57
Patient reactions ($n = 532$)	2.7[a]	0.7	2.4[b]	0.6	2.6[c]	0.6	≤0.01
Barriers to service ($n = 533$)	3.1	0.7	3.3	0.6	3.3	0.6	0.13
Attitudes towards helping ($n = 535$)	3.7	0.8	3.6	0.7	3.7	0.6	0.39
Opioids and practice ($n = 535$)	3.8	0.7	3.8	0.6	3.8	0.5	0.85
Priority and time ($n = 536$)	2.9[d]	0.7	3.2[e]	0.8	2.9[f]	0.8	≤0.01
Research ($n = 532$)	3.3	0.7	3.3	0.7	3.3	0.7	0.73
SBI delivery ($n = 539$)	3.2	1.0	3.1	0.9	3.0	0.9	0.26

[a]Health system is significantly higher than chain ($P < 0.05$); [b]chain is significantly lower than health system and independent ($P < 0.05$); [c]independent is significantly higher than chain ($P < 0.05$), [d]health system is significantly lower than chain; [e]chain is significantly higher than health system and independent; [f]independent is significantly lower than chain. Utah: $n = 379$; Texas: $n = 360$. M, mean; SD, standard deviation.

change their use); (3) *barriers to service* (comprised of statements about barriers that would impede SBI practice); (4) *attitudes towards helping* (comprised of statements about attitudes of pharmacists towards helping those who misuse prescription opioids); (5) *opioids and practice* (comprised of statements about pharmacists' knowledge and confidence in addressing prescription opioid misuse); (6) *priority and time* (comprised of statements regarding whether SBI is within pharmacists' scope of practice and time availability); (7) *research* (comprised of statements about pharmacists' desire for involvement in SBI research and methods of misuse identification); and (8) *SBI delivery* (comprised of statements about pharmacists' preference of mediums for SBI delivery). With the exception of the *research* subscale, all α levels were adequate for exploratory research ($\alpha \geq 0.60$).[30]

Scale differences

Table 3 reports the combined Utah and Texas subscale means and *t*-tests for subscale differences by state. The only significant difference ($t = 4.19$, df = 667, $P \leq 0.01$) was for Utah pharmacists (M = 3.7, SD = 0.6) who had lower mean scores than Texas pharmacists (M = 3.9, SD = 0.6) for the *opiates and practice* subscale. The highest overall mean levels of agreement for pharmacists in Utah and Texas were for the *motivators to service* (M = 3.9, SD = 0.5), *opioids and practice* (M = 3.8, SD = 0.6), and *attitudes towards helping* (M = 3.7, SD = 0.7) subscales. The lowest overall mean level of agreement for pharmacists in Utah and Texas was for *patient reactions* subscale (M = 2.6, SD = 0.7). Due to the absence of major differences in subscale scores, the remaining subscale analyses (Tables 4 and 5) are reported for the aggregate Utah and Texas sample.

Table 4 reports ANOVA differences for subscales by practice location for all survey respondents. Health system pharmacists had significantly (*F*-test (*F*) = 7.51, df = 531, $P \leq 0.01$) higher mean scores (M = 2.7, SD = 0.7) than chain (M = 2.4 SD = 0.6) and independent pharmacists (M = 2.6 SD = 0.6) for believing *patients reactions* would be favourable towards SBI for potential opioid abuse. Health system pharmacists (M = 2.9 SD = 0.7) and independent pharmacists (M = 2.9 SD = 0.8) reported significantly lower ($F = 10.98$, df = 535, $P \leq 0.01$) mean scores than chain pharmacists (M = 3.2 SD = 0.8) for the *priority and time* subscale (indicating health system and independent pharmacists were more likely to have time for SBI and believe it would be a priority).

Table 5 shows Pearson correlations calculated between years of practice and subscale composite scores (see Survey Instrument and Item Analysis subsection above for subscale calculation method). Results showed that pharmacists with more years of practice experience perceived fewer *barriers to service* provision (r = –0.10, $P < 0.05$), possessed greater ability in addressing *opioids and practice* issues (r = 0.17, $P < 0.01$), and were less interested in being involved with *research* projects (r = –0.10, $P < 0.05$).

Table 5 Pearson correlations for survey subscales with years of practice

	Motivators to service ($n = 614$)	Patient reactions ($n = 602$)	Barriers to service ($n = 608$)	Attitudes towards helping ($n = 614$)	Opioids and practice ($n = 609$)	Priority and time ($n = 613$)	Research ($n = 602$)	SBI delivery ($n = 618$)
Years of practice	–0.09	0.02	–0.10[a]	0.03	0.17[b]	0.00	–0.10[a]	–0.03

[a]≤0.05; [b]≤0.01. Utah: $n = 379$; Texas: $n = 360$. SBI, screening and brief intervention.

Table 6 Proportional differences for current services[a]

Current service	Variable	*n*	% Reporting service	OR	95% CI
Screening	Utah	151	43.0	0.92	(0.68–1.25)
	Texas	144	45.0	1.08	(0.80–1.47)
Discussing	**Utah**	**162**	**46.4**	**0.66**	**(0.48–0.89)**
	Texas	**182**	**56.9**	**1.52**	**(1.12–2.07)**

[a]Bold indicates $P \leq 0.05$. Utah: $n = 379$; Texas: $n = 360$. CI, confidence interval; OR, odds ratio.

Current services

Table 6 shows the results for proportional differences for current services. Utah pharmacists were 34% less likely to currently discuss prescription opioid abuse, and Texas pharmacists reported to be 52% more likely to currently discuss prescription opioid abuse with patients than Utah practitioners.

Discussion

Interest in opioid abuse

One of the purposes of this survey was to examine pharmacists' level of interest in addressing prescription opioid abuse. The *attitudes towards helping* subscale had one of the highest levels of endorsement of the eight, indicating that pharmacists have a relatively positive perspective on helping those with prescription opioid problems. This subscale also contained the item that stated, 'I want to help patients who misuse prescription opioids,' to which roughly 90% of respondents endorsed as 'agree' or 'strongly agree.' Further, although the *priority and time* subscale had an overall neutral score, pharmacists in health system and independent settings had more positive perspectives for SBI in their practice. Altogether, these findings appear to indicate that pharmacist disposition towards helping patients who misuse opioids is positive and relatively consistent between states with divergent misuse severity levels.

Screening and brief intervention in pharmacies

This project was also designed to assess pharmacists' beliefs regarding whether pharmacies might be effective settings to address prescription opioid misuse with SBI. Roughly half of the respondents agreed that pharmacies would be good locations for testing SBI, and about half of the pharmacists also agreed that SBI is a service they should be involved in delivering. Moreover, the endorsement of the *opiates and practice* subscale was second highest of all scales, which demonstrates that pharmacists believe they possess the confidence and knowledge necessary for working with patients who misuse prescription opiates. The small but significantly higher mean scores reported by Texas practitioners (Texas M = 3.9; Utah M = 3.7) for the *opiates and practice* subscale may have some connection to the significant proportional differences that showed Texas pharmacists had greater odds for currently discussing prescription opioid abuse. It could be the case that Texas pharmacists are generally vigilant in discussing opioid issues with patients, and therefore report more knowledge and confidence. On the other hand, Utah pharmacists may feel overburdened with the opioid abuse problem in their state and subsequently address it less. In either case, opinions for both states were in the same positive direction, indicating similarly positive views. Furthermore, future research could be beneficial to examine, in particular, the reason for the higher rates of reported screening in Texas compared to Utah.

In relation to currently delivered services, pharmacists were slightly positive (more than neutral) with their interest in hosting or being directly involved in research regarding SBI. However, looking at the individual items within the scale, nearly 85% of respondents indicated that electronic prescription record systems could be utilized as effective sources for identifying patients who might misuse. This non-invasive strategy for identification of misuse has been applied in previous research[20] and has the potential for low-cost widespread utilization. Furthermore, while not specifically asked in this survey, PDMPs could be used in concert with prescription management systems in order to enhance and possibly validate information derived from prescription record-keeping systems. An appropriate next step for this line of research would be for a screening study to be undertaken. Using electronic prescription record systems/PDMPs in conjunction with self-report and biological drug screenings for opioid use may provide an effective and efficient method for identifying patients who might benefit from interventions, although recruiting patients to participate in such research would likely be challenging due to possible concerns of time, confidentiality and repercussions if prescription misuse (or use of illicit drugs) was reported. Such barriers to evaluation

and implementation of SBI have been overcome in similar medical settings.

Pharmacists were ambivalent about how patients might react to SBI. Health system pharmacists were the most positive about potential *patient reactions*. Looking at the individual items within the subscale illuminates pharmacists' views on how patients would react. Nearly 75% of pharmacists believe that most patients would not resent being asked about their use of prescription opiates. However, 65% of respondents were also aware that patients who may be misusing opioids would be most likely to object. The neutrality in the subscale is largely driven by pharmacists being unsure if their advice would be well received and that patients would actually change misuse behaviours. Pharmacists not being sure about patients' potential reactions could possibly be ameliorated if practitioners knew more of, and had confidence in, the screening and intervention itself. This seems to be evident by the high endorsement of the *motivators to service* subscale that lists screening and intervention resources and tools that would increase pharmacists' involvement in SBI. Nonetheless, pharmacists were mostly neutral in their opinions regarding whether SBI should be delivered in person or via computer. Future research regarding the most appropriate and efficacious methods for screening and intervention in pharmacies could help pharmacists better anticipate how SBIs would be received. Piloting such interventions could also provide a preliminary understanding of what behavioural changes could be expected from patients.

Education and training

We also assessed education and training needs that would allow pharmacists to become further engaged in SBI activities for prescription opioid misuse. As we mentioned earlier, the *motivators to service* subscale (e.g. referral resources and screening and intervention techniques) was the highest of any of the eight. This result shows promise that SBI training and resource tools could aid in motivating pharmacists' engagement in SBI. The *barriers to service* subscale also identified training or education gaps that could impede pharmacists from becoming engaged in addressing prescription opioid misuse. Responses were neutral for this scale, possibly indicating that pharmacists did not view the barriers listed in the survey as insurmountable. Altogether, through combining the right resources/tools with the interest expressed by pharmacists in helping and their beliefs regarding the value of SBI, brief interventions in pharmacies have the potential to make a meaningful contribution in addressing the national prescription opioid misuse epidemic.

Limitations

Although the response rate to this survey is similar to other published internet-based pharmacy surveys (Dohler *et al*.[31] = 7%, Dolan *et al*.[32] = 8%, Droege and Assa-Eley[33] =24%, Inquilla *et al*.[34] = 30%, Pinneke and Clark[35] = 30% and Pollard and Clark[36] = 15%), it was nonetheless lower than response rates generally recommended for internet surveys.[37] This low response could have subsequently produced a bias within the survey results. In addition to the response rate, a response bias could have been caused by the web-based nature of the survey, in that younger pharmacists who may feel more comfortable using web-based applications responded to the survey at a higher rate than older pharmacists. A response bias also could have been generated by the fact that Utah pharmacists were contacted from a list of all licensed pharmacists while pharmacist members of the Texas Pharmacy Association were contacted in Texas.

Examining the data helps to demonstrate that a response bias may not have occurred in this survey. First, the numbers of respondents practising in health systems, chains and independently are similar to those of the actual proportions in Utah and Texas, providing some degree of evidence that a bias to the survey items did not occur based on practice settings. Second, it does not appear to be the case that only younger pharmacists responded to the survey, particularly because the mean years of practice for Utah pharmacists was 13 and for Texas it was 27. These mean years indicate that respondents on average possessed several years of professional pharmacy experience, particularly in Texas. Lastly, regardless of differences noted in demographics, practice background and level of prescription opioid abuse severity, Utah and Texas pharmacists' responses to the survey were highly similar – as indicated by the absence of mean or substantive differences for the subscales. This absence of differences among the two states indicates that regardless of pharmacists' characteristics, responses were consistent. This statistical evidence showing that a response bias may not have occurred would be strengthened by including other states in a subsequent administration of this survey for comparison purposes. If an additional survey of other states showed similar responses to those in this project, such results would also add credibility to the findings herein.

Conclusion

This survey provides an initial insight into pharmacists' interest, beliefs and opinions about prescription opioid abuse and SBI. Despite the different prevalence rates of prescription opioid abuse in Utah and Texas, pharmacists' views regarding opioid abuse and SBI were similar. Altogether, pharmacists are interested in helping those with potential misuse issues; they believe SBI may be a valuable service for identifying and intervening with opioid abuse, and they feel capable in their knowledge and ability to do so. Nonetheless, pharmacists were not confident that patients will take their advice, respond positively and make needed behaviour changes. Respondents also were not confident regarding the manner in which screenings and interventions should occur. This ambivalence could possibly be ameliorated by future research about screening and intervention techniques in pharmacies. Such research results could subsequently serve as helpful resources to increase pharmacists' motivation for service provision. Electronic prescription records systems are potentially helpful tools for identifying patients who misuse. For instance, health system pharmacies within communities may be viable locations to begin developing these tools, given the likelihood of networked prescription record systems already in place. If the results of the current project could be further verified and techniques for SBI in pharmacies ultimately developed, residency programmes and continuing education models could be developed to disseminate and test SBI in the pharmacy

setting. Delivering SBI in pharmacies has the potential to provide an additional important resource in addressing prescription opioid abuse and in helping patients reduce possible misuse.

Declarations

Conflict of interest

The Author(s) declare(s) that they have no conflicts of interest to disclose.

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Authors' contributions

Gerald Cochran designed and carried out the project, performed the data analyses and wrote the largest portions of the manuscript. Craig Field, Kenneth Lawson and Carlton Erickson each aided in the design of the project, interpretation of analyses, writing portions of the manuscript and provided critical feedback on drafts of the manuscript. All Authors state that they had complete access to the study data that support the publication.

References

1. Centers for Disease Control and Prevention. Morbidity and mortality weekly report. Vital signs: overdoses of prescription opioid pain relievers – United States, 1999–2008. Atlanta, GA: Centers for Disease Control and Prevention, 2011.
2. Substance Abuse and Mental Health Services Administration. The NSDUH report: trends in nonmedical use of prescription pain relievers: 2002 to 2007. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2009.
3. Substance Abuse and Mental Health Services Administration. Results from the 2007 National Survey on drug use and health: national findings. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2008.
4. Coalition Against Insurance Fraud Washington. Prescription for peril: how insurance fraud finances theft and abuse of addictive prescription drugs. Washington, DC: Coalition Against Insurance Fraud, 2007.
5. Baehren DF *et al*. A statewide prescription monitoring program affects emergency department prescribing behaviors. *Ann Emerg Med* 2010; 56: 19–23.
6. Paulozzi LJ *et al*. Prescription drug monitoring programs and death rates from drug overdose. *Pain Med* 2011; 12: 747–754.
7. Ossoff RH, Thomason CD. Beyond pain management: doctor shopping. *J Health Care Compl* 2011; 13: 57–76.
8. Centers for Disease Control and Prevention. Vital signs: prescription painkiller overdoses in the US. Atlanta, GA: Centers for Disease Control and Prevention, 2011.
9. Bertholet N *et al*. Reduction of alcohol consumption by brief alcohol intervention in primary care: systematic review and meta-analysis. *Arch Intern Med* 2005; 165: 986–995.
10. Havard A *et al*. Systematic review and meta-analyses of strategies targeting alcohol problems in emergency departments: interventions reduce alcohol-related injuries. *Addiction* 2008; 103: 368–376.
11. Kaner E *et al*. The effectiveness of brief alcohol interventions in primary care settings: a systematic review. *Drug Alcohol Rev* 2009; 28: 301–323.
12. McQueen J *et al*. Brief interventions for heavy alcohol users admitted to general hospital wards. *Cochrane Database Syst Rev* 2009; (3): CD005191.
13. Nilsen P *et al*. A systematic review of emergency care brief alcohol interventions for injury patients. *J Subst Abuse Treat* 2008; 35: 184–201.
14. Jamison RN *et al*. Substance misuse treatment for high-risk chronic pain patients on opioid therapy: a randomized trial. *Pain* 2010; 150: 390–400.
15. Zahradnik A *et al*. Randomized controlled trial of a brief intervention for problematic prescription drug use in non-treatment-seeking patients. *Addiction* 2009; 104: 109–117.
16. Inciardi JA *et al*. Mechanisms of prescription drug diversion among drug-involved club- and street-based populations. *Pain Med* 2007; 8: 171–183.
17. Cicero TJ *et al*. Multiple determinants of specific modes of prescription opioid diversion. *J Drug Issues* 2011; 41: 283–304.
18. El-Aneed A *et al*. Prescription drug abuse and methods of diversion: the potential role of a pharmacy network. *J Subst Use* 2009; 14: 75–83.
19. White AG *et al*. Analytic models to identify patients at risk for prescription opioid abuse. *Am J Manag Care* 2009; 15: 897–906.
20. Heather N *et al*. Randomised controlled trial of two brief interventions against long-term benzodiazepine use: outcome of intervention. *Addict Res Theory* 2004; 12: 141–154.
21. Centers for Disease Control and Prevention. Policy Impact: Prescription Painkiller Overdoses. Atlanta, GA: Centers for Disease Control and Prevention, 2011. http://www.cdc.gov/homeandrecreationalsafety/rxbrief/ (accessed 9 March 2013).
22. Substance Abuse and Mental Health Services Administration. The NSDUH report: nonmedical use of pain relievers in substate regions: 2004 to 2006. Rockville, MD: Substance Abuse and Mental Health Services Administration, Office of Applied Studies, 2008.
23. Forrester MB. Oxycodone abuse in Texas, 1998–2004. *J Toxicol Environ Health A* 2007; 70: 534–538.
24. Maxwell J. Substance abuse trends in Texas June 2011. Austin, TX: Gulf Coast Addiction Technology Transfer Center, The University of Texas at Austin, 2011.
25. Fitzgerald N *et al*. Developing and evaluating training for community pharmacists to deliver interventions on alcohol issues. *Pharm World Sci* 2009; 31: 149–153.
26. Sheridan J *et al*. Screening and brief interventions for alcohol: attitudes, knowledge and experience of community pharmacists in Auckland, New Zealand. *Drug Alcohol Rev* 2008; 27: 380–387.
27. IBM. *SPSS 19*. Chicago, IL: IBM, 2011.
28. Utah Medical Education Council. Utah's pharmacist workforce. Salt Lake City, UT: Utah Medical Education Council, 2002.
29. Texas State Board of Pharmacy. Licensure statistics. Austin, TX: Texas State Board of Pharmacy, 2011.
30. Hair J *et al*. *Multivariate Data Analysis: A Global Perspective*. Upper Saddle River, NJ: Pearson, 2010.
31. Döhler N *et al*. Task allocation in cancer medication management–Integrating the pharmacist. *Patient Educ Couns* 2011; 83: 367–374.

32. Dolan SM *et al*. Pharmacists' knowledge, attitudes, and practices regarding influenza vaccination and treatment of pregnant women. *J Am Pharm Assoc* 2012; 52: 43–51.
33. Droege M, Assa-Eley MT. Pharmacists as care providers: personal attributes of recent pharmacy graduates. *Am J Pharm Educ* 2005; 69: 290–295.
34. Inquilla CC *et al*. Pharmacists' perceptions of computerized prescriber-order-entry systems. *Am J Health Syst Pharm* 2007; 64: 1626–1632.
35. Pinneke S. Variable infusion rates associated with TKO/KVO abbreviations: a survey of Illinois hospital pharmacists. *Hosp Pharm* 2010; 45: 549–551.
36. Pollard SR, Clark JS. Survey of health-system pharmacy leadership pathways. *Am J Health Syst Pharm* 2009; 66: 947–952.
37. Dillman D. *Mail and Internet Surveys: The Tailored Design Method*. Hoboken, NJ: John Wiley & Sons, 2007.