Community pharmacist knowledge, attitudes and confidence regarding naloxone for overdose reversal

Running head: Community pharmacy and naloxone

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Abstract

Aim: Given the potential to expand naloxone supply through community pharmacy, the aim of this study was to estimate Australian pharmacists': (1) level of support for overdose prevention, (2) barriers and facilitators for naloxone supply, and (3) knowledge about naloxone administration.

Design: Online survey from nationally representative sample of community pharmacies.

Setting: Australia, September–November 2015.

Participants: 1,317 community pharmacists were invited to participate with 595 responses (45.1%).

Measurements: We assessed attitudes towards harm reduction, support for overdose prevention, attitudes and knowledge about naloxone. We tested the association between attitudes towards harm reduction and different aspects of naloxone supply.

Findings: Pharmacists were willing to receive training about naloxone ($n = 479$, 81%) and provide naloxone with a prescription ($n = 537$, 90%). Fewer ($n = 234$, 41%) were willing to supply naloxone over the counter. Positive attitudes towards harm reduction were associated with greater willingness to supply naloxone with a prescription (OR 1.15, 95% CI: 1.11–1.19) and over the counter (1.13, 95% CI: 1.09–1.17). Few pharmacists were confident they could identify appropriate patients ($n = 203$, 34.1%) and educate them on overdose and naloxone use ($n = 190$, 31.9%). Mean naloxone knowledge scores were 1.8 (SD 1.7) out of 5. More than half the sample identified lack of time, training, knowledge and reimbursement as potential barriers for naloxone provision.

Conclusion: Community pharmacists in Australia appear to be willing to supply naloxone.

Low levels of knowledge about naloxone pharmacology and administration highlight the importance of training pharmacists about overdose prevention.

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Introduction

The increasing incidence of opioid overdose in many high income countries has highlighted the potential role of naloxone as a strategy to address overdose (1). Naloxone, an opioid antagonist medication, has been used in clinical settings for more than 40 years. More recently, programs that supply naloxone to bystanders for administration in the community have been established in both the United States and the United Kingdom, with research confirming the feasibility and cost effectiveness of such programmes (2-7). These programs have largely targeted people who inject drugs, with community advocacy groups being heavily involved in their establishment.

Naloxone supply through community pharmacy has the potential to expand the geographic reach of take-home naloxone initiatives. Community pharmacies supply medications to the public and represent widely accessible health care sites in terms of geographic locations and opening hours. Many patients with an overdose risk may not be in contact with existing providers of take-home naloxone, notably pain patients using prescription opioids, in addition to those that choose to avoid services identified for people who use drugs.

In countries such as Scotland, England and Australia, community pharmacies increasingly provide services to reduce opioid-related harm (8-10). These include the supply of injecting equipment and supervised methadone and buprenorphine dosing. Despite this, some challenges have been identified, with confidence and attitudes identified as potential barriers in delivering substance use treatment (11, 12). Recent research in Scotland identified

that over time, attitudes towards these programs are becoming more positive; pharmacists have demonstrated a willingness to receive further training, which in turn appears to increase participation in harm-reduction activities (13).

In February 2016, naloxone became available in Australia as an over-the-counter (OTC) medication (i.e., able to be sold without a prescription) (14). This provides an opportunity to increase naloxone supply, depending on consumer demand and the willingness of pharmacists to be involved in supply. Pharmacists are not legally compelled to sell or supply medications, but they are required to provide continuity of care (i.e., an alternative source) if they decline to supply on moral grounds (15, 16).

Therefore, the aims of this study are to estimate:

- 1) The level of pharmacist support for overdose prevention and attitudes towards harm reduction;
- 2) Barriers and facilitators for naloxone supply, including the level of association between attitudes and support and pharmacist willingness to engage in naloxone supply, and
- 3) Pharmacists' levels of knowledge about naloxone administration.

Method

Design

We conducted an online anonymous survey of a random sample of Australian community pharmacies.

Sample

The random sample of pharmacies was created using a Microsoft Excel random number generator applied to an existing list of Australian community pharmacies (18). The number of pharmacies selected from each state was proportional to the total number of pharmacies in that state, with the aim to recruit a representative sample of 10% of community pharmacies based on sample size calculations confirming that this would appropriately power all planned analyses. The final sample represented 11% of the 5,450 pharmacies in operation across Australia (19).

Participants

Pharmacies were initially contacted by telephone. The pharmacist-in-charge was informed of the purpose of the study, and invited to participate. One pharmacist per pharmacy (the pharmacist-in-charge) was invited to participate. After identifying duplicate pharmacies on the list and pharmacies that were no longer in operation, a total of 1,317 pharmacies were successfully contacted between September and November 2015. Most (92.4%, $n = 1,217$) pharmacists-in-charge expressed an interest in participating, and agreed to receive an email link to an online survey. The 100 pharmacists that indicated they were not interested most commonly cited being too busy to participate; no further data were collected from these pharmacists.

Procedures

This survey was administered using the online survey application Lime Survey, and was designed to take fewer than 20 minutes to complete (mean completion time was 26.6 minutes, median 18.7 minutes). A reminder email was sent to pharmacists after a week. Pharmacists who completed the survey were reimbursed AUD\$40 after entering their details in a separate online portal to provide anonymity (i.e., identifying details were not linked to survey responses). Pharmacists could elect to receive a cheque or bank deposit, or nominate a charity to receive the funds. We used methods demonstrated to maximise participation including reimbursing participants, limiting length, using closed questions, personally contacting participants before sending out the survey, emailing reminders and clearly indicating that the research was being conducted by an academic institution (20).

Measures

Survey questions were drawn from previous studies that have been conducted with pharmacists and/or in the area of harm reduction in the United Kingdom and the United States, and from discussions with the investigators that led these studies, who were members of the expert advisory group for this study (8, 21-23) (see Appendix 1 for an overview of survey questions and sources). The survey was reviewed by local experts, including representatives from Australian pharmacy organisations. Wording was adapted for Australian circumstances.

The survey asked demographic questions, including pharmacy, pharmacist and current opioid-dispensing characteristics (8, 13, 22). Data were collected regarding the

provision of opioid substitution therapy (OST) and participation in needle exchange programs.

The survey included 11 items from an attitude scale designed by Matheson et al. (1999) (21), which assesses attitudes towards aspects of pharmacy practice in the area of opioid dependence. Participants responded to each item on a five-point rating scale ranging from 'strongly disagree' to 'strongly agree'. To calculate a total attitude score the individual item ratings were assigned a value from -2 to 2 (with higher values indicating more positive attitudes), and summed.

Participants rated their willingness to engage in various actions related to naloxone supply on a four-point scale ('*already doing this/have done this*', '*extremely willing to do this*', '*somewhat willing to do this*' or '*not at all willing to do this*'). Willingness was coded so that participants who had already engaged in these actions or who would be extremely willing to engage in them were classified as 'more willing', while all other participants were categorised as 'less willing'. Participants were also asked whether they would be comfortable supplying naloxone to individuals in specific situations, and responded on a three-point scale ('*would feel comfortable*', '*would feel comfortable to supply after some training*' or '*would not feel comfortable*'). Participants who indicated that they would feel comfortable in that situation or would feel comfortable after training were classified as comfortable.

The survey included five items that measured support for overdose prevention. Participants rated each statement on a six-point scale, ranging from 'strongly disagree' to 'strongly agree'. Each rating was assigned a value from 1 to 6 (higher values indicated greater support), and these were summed for each participant to calculate a score indexing

overall support for overdose prevention. Twelve barriers for implementation of naloxone in pharmacy were assessed, with one further open-ended option. Finally, five items from the Opioid Overdose Knowledge Scale (OOKS) (24), a validated scale used to assess knowledge about overdose and the administration and effects of naloxone, was administered. All procedures were approved by the University of New South Wales Human Research Ethics Advisory Panel: Social and Health Research (HC15556).

Statistical analysis

Based on previous studies that have found some demographic characteristics were associated with attitudes towards harm reduction (13), we used one-way ANOVAs or bivariate correlation analyses to test associations between demographic variables and attitudes towards naloxone and support for overdose prevention.

Logistic regression analyses were used to test whether attitude was associated with the provision of opioid-related services, and willingness to engage in actions relating to naloxone supply. A further logistic regression was conducted to test if the frequency with which the pharmacy dispensed prescription opioids was related to willingness. Results are considered significant at the 5% significance level, and 95% confidence intervals are presented where appropriate.

Results

Participants

The following analyses were based on a final sample of 595 participants (45.1% of the pharmacists initially contacted) that completed the survey. 172 participants results were excluded as they commenced, but did not complete the survey. A further 14 participants' results were excluded from analyses because they completed the survey in fewer than five minutes, and it was assessed that the questions could not reasonably have been read and answered in this time. The excluded participants did not differ significantly from the final sample on any demographic variables (data not shown). Participants were recruited in proportion to the number of pharmacies in each state or territory: Victoria (n = 120, 20.2%), Tasmania (n = 16, 2.7%) New South Wales (n = 226, 38.0%), Queensland (n = 10, 18.5%), Northern Territory (n = 5, 0.8%), Western Australia (n = 63, 10.6%), South Australia (n = 45, 7.6%) and the Australian Capital Territory (n = 10, 1.7%).

Demographics and services provided

Respondents had been practising pharmacy for an average of 6.5 years ($SD = 3.3$). Around half the sample identified as male, were between 25 and 34 years old, and worked in a pharmacy that provided some form of OST (see Table 1). OST provision included supervised methadone dosing (n = 282, 47%), supervised buprenorphine dosing (n = 268, 45%), and weekly or monthly unsupervised buprenorphine-naloxone supply (n = 146, 25%). Most pharmacies received opioid prescriptions a minimum of several times a day (n = 469, 78.8%).

Attitude scale

One item was deleted from the attitude scale, as it displayed a low item-total correlation (.08), possibly because it was the only statement that dealt explicitly with the financial aspects of responding to OST. With this item deleted, the ten-item attitude scale demonstrated acceptable internal consistency (Cronbach's $\alpha = .797$), and all item-total correlations were above .3. The mean attitude score was 6.18 ($SD = 5.84$; range: -14 to 20), reflecting, on average, positive attitudes towards substance use treatment and harm reduction services (see Appendix 2 for individual items).

Participant demographics were associated with attitude score (Table 1). On average, males were more positive than females. There was a small positive association between years practising pharmacy and positive attitude. More positive attitudes scores were associated with more frequent opioid prescriptions in the past week. There were no differences in attitude score depending on any other demographic variable.

Support for overdose prevention

Items that assessed support for overdose prevention displayed adequate internal consistency (Cronbach's $\alpha = .674$), and all item-total correlations were above .3. Across participants, the average total support score was 22.86 ($SD = 4.54$; range $5-30$) out of a possible 30, where a higher score indicates greater support for overdose prevention activities.

The level of support for overdose prevention was associated with demographic characteristics (Table 1). On average, males had greater support for overdose prevention than females. Support for overdose prevention was associated with a greater number of received opioid prescriptions in the past week. There were no associations with other demographic variables.

Confidence, willingness and comfort in supplying naloxone

Table 2 provides a summary of responses to items assessing confidence, willingness and comfort in supplying naloxone to customers. In general, participants did not express high degrees of confidence about naloxone supply. One in three pharmacists reported confidence in identifying appropriate patients ($n = 203$, 34.1%,) and educating them on overdose and naloxone use ($n = 190$, 31.9%). Most participants indicated that they were more willing, rather than less willing, to engage in actions related to naloxone supply, with the exception of proactively identifying individuals for naloxone supply, which 49% ($n = 290$) of respondents were 'more willing' to do, and dispensing naloxone as an OTC medication, which 41% ($n = 243$) were 'more willing to' do. Most participants indicated that they were comfortable supplying naloxone to individuals in all the circumstances outlined in the survey, with the lowest levels of comfort reported in supplying naloxone to people who purchase syringes (68.4%) and to an individual on OST (77.6%).

More positive attitudes towards naloxone supply were reported by pharmacists working in pharmacies that provided OST ($p < .001$), that participated in a needle-syringe programme (NSP, $p < .001$), and that sold syringes ($p < .001$). These associations remained when demographic variables associated with positive attitudes towards harm reduction (age, gender, years practising pharmacy and frequency of opioid prescriptions) were controlled for (Table 3). Positive attitudes towards naloxone supply were also associated with willingness to engage in all actions related to naloxone supply, and this association remained significant after controlling for age, gender, years practising and frequency of prescriptions.

Overall, greater support for overdose prevention was associated with whether the pharmacy provided OST ($p = .004$) and remained significant after controlling for gender, age and frequency of supply of opioid prescriptions ($p = .003$) (Table 3). Support for overdose prevention was not associated with the pharmacy's participation in NSP ($p = .926$), or whether the pharmacy sold syringes ($p = .060$). Support for overdose prevention was associated with willingness to engage in all actions related to naloxone supply, which remained significant after controlling for demographics.

Barriers to implementing a naloxone access program

The most commonly identified barriers that participants identified to implementing a naloxone access program at their pharmacy were the time that would be involved, a lack of training and knowledge of state laws, and lack of reimbursement for patient education and counselling (Table 2).

Experience with naloxone, training and reimbursement

Fewer than one in four ($n = 136$, 23%) participants worked in a pharmacy that currently stocked naloxone. Of those, 28% ($n = 38$ or 6% of the whole sample) reported they had dispensed naloxone for an individual to take home for opioid reversal. Only one in 20 ($n = 27$, 5%) had received education about patient counselling when dispensing naloxone.

Participants were asked about their views on the appropriate length for pharmacist education about naloxone. Approximately three-quarters of respondents were willing to spend under an hour receiving such education. Most (>90%) participants thought it would be *feasible* for community pharmacists to spend up to 15 minutes training patients or carers to use naloxone; 22% thinking fewer than five minutes would be feasible. Only 9% felt that

fewer than five minutes would be *required* to administer such training to patients and carers: two thirds (67%) reported that between five and 15 minutes was required.

We asked respondents to suggest the level of reimbursement they felt was appropriate for a pharmacist to receive for spending 15 minutes to train a patient or carer to use naloxone. The average level of reimbursement suggested was AUD\$33.38 ($SD = \21.69; range: \$0–200).

Respondents with more positive attitudes toward harm reduction reported that a lower level of reimbursement, on average, was appropriate ($b = -.402, p = .008$), and this association remained significant after controlling for age, gender, years practising pharmacy and frequency of opioid prescription ($b = -.401, p = .009$; see Table 3). Support for overdose prevention was not associated with reimbursement ($p = .305$).

Knowledge about naloxone

We asked participants to answer questions relating to their knowledge of naloxone pharmacology and administration. For most questions, most participants either indicated that they did not know the answer or selected an incorrect response (see Table 4). Participants scored a mean of 1.8 ($SD 1.7$) out of five in the knowledge questions.

Discussion

This is the first study to assess in detail knowledge and perceptions of community pharmacists regarding naloxone supply. Most pharmacists reported that they were not confident in either identifying potential people to receive naloxone or in training people to use naloxone. Three in five pharmacists were not comfortable with OTC supply, and most were not able to correctly answer questions on naloxone administration. In light of these findings, it is essential that pharmacists receive training in how to use naloxone in order to increase their confidence in identifying those who may benefit from naloxone, and enable effective delivery of information to customers about its use. These findings have international relevance, as many countries are currently exploring pharmacy supply of naloxone, and in Australian pharmacies, OTC naloxone is now available. This places a sharp focus on addressing these knowledge gaps, to maximise the potential for naloxone supply in this setting.

Pharmacists were willing to be involved in naloxone supply, and many had positive attitudes towards harm reduction interventions, consistent with previous studies on harm reduction and pharmacy settings (13, 25). Those already involved in, and supportive of other harm reduction interventions (e.g. OST and NSP) may be those who will first engage in promoting the supply of naloxone through community pharmacies at the lowest cost to consumers, and may be important to assist in education of and advocacy with other pharmacists. This has implications in targeting in training. However, it was clear that there is support for naloxone among pharmacists in general, suggesting that there are opportunities for good coverage of naloxone supply across community pharmacies.

Importantly, many participants identified barriers to naloxone supply, including training and knowledge of laws around naloxone. These barriers are modifiable - and pharmacists indicated willingness to receive training in this area. The barrier of time also points to the importance of time-efficient naloxone education and supply to customers. Brief interventions (five to ten minutes) have been demonstrated to be effective (26), and should be feasible in a standard pharmacy consultation based on pharmacists' responses to our survey. Other models of supply, in which naloxone recipients are trained offsite before collecting naloxone, or in which pharmacists are reimbursed specifically for providing screening and brief intervention have also been proposed (27), and may help to address this issue.

Cost is a clear potential barrier to largescale pharmacy naloxone supply. Those with more positive attitudes towards harm reduction felt less remuneration was required, but thought the cost of the medication alone (approximately AUD\$20 per 400mcg dose) may be a barrier. The suggested remuneration for 15 minutes of pharmacists' time (an average of AUD\$33) is unlikely to be affordable for many people seeking naloxone. With international calls for OTC naloxone availability (28-31), careful consideration of to how to address these cost barriers needs to occur. Other supply models, including standing orders and collaborative practice agreements, may facilitate pharmacist-initiated supply without the same cost implications as OTC supply (32, 33).

Although the majority of pharmacists supported naloxone supply to all patient groups proposed, pharmacist reported being somewhat less comfortable in supplying naloxone to customers on OST, and to customers purchasing syringes; these would arguably be the highest-risk groups in terms of overdose risk. In contrast, pharmacists were most comfortable

to supply naloxone to chronic pain patients on a high opioid dose. Qualitative work to understand the reasons for discomfort may help to address this as a barrier to naloxone supply. Although moral or ethical concerns with naloxone supply have previously been suggested as a concern with naloxone supply (34), few pharmacists (23%) identified this as a potential barrier to supply.

Limitations

One potential limitation of our study was the response rate of 45%, which may have meant we did not obtain a representative sample of pharmacists. We compared our sample to that in a recent survey of community pharmacists in a study of cardiovascular disease (35); our sample was broadly comparable in terms of age, years of practice, practice location and type of pharmacy. We did recruit a slightly higher proportion of pharmacists currently involved in DST dispensing (50%), compared to national levels (40% of community pharmacies) (36). It is therefore possible that pharmacists that did not participate in the study may be slightly less supportive of naloxone.

A second potential limitation may have been social desirability bias, though anonymous data collection was used to minimise this potential effect. Data for the OOKS were only available from 251 participants due to a technical issue, though this means that the data were missing at random. Finally, due to necessary limits on the length and nature of online data collection, a detailed exploration of reasons behind the attitudes and perceptions was not possible, and we could not explore issues related to different formulations of

naloxone; injectable naloxone is currently the only formulation available through community pharmacies in Australia.

Conclusions

We found high levels of support for naloxone supply among community pharmacists. Low levels of knowledge and confidence underscore the need for further pharmacist training. Greater support for overdose prevention was found among those involved in provision of other services focused upon reducing harms related to injecting drug use and opioid dependence, though the vast majority of pharmacists agree that overdose prevention is important and that pharmacists have a role in this area. There is an important opportunity to expand naloxone supply in community pharmacies. Given the movement towards OTC naloxone internationally, training of the pharmacy workforce appears critical to ensure widespread supply and appropriate use of naloxone by customers.

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Table 1: Mean (SD) attitude towards harm reduction and support for overdose prevention depending on demographic variables

		<i>n (%)</i>	<i>Attitude score</i>		<i>Support for overdose prevention</i>	
Type of Pharmacy			<i>p</i> = 0.185	<i>F</i> = 1.70	<i>p</i> = 0.324	<i>F</i> = 1.13
	<i>Independent</i>	302 (50.8)		6.5 (5.7)		22.6 (4.6)
	<i>Small Chain (2 - 9 branches)</i>	112 (18.8)		5.3 (6.4)		22.8 (4.7)
	<i>Large Chain (10 + branches)</i>	181 (30.4)		6.2 (5.6)		23.3 (4.5)
Pharmacy Location			<i>p</i> = 0.712	<i>F</i> = .458	<i>p</i> = 0.969	<i>F</i> = .084
	<i>Standalone/Shopping Strip</i>	384 (64.5)		6.4 (5.8)		22.9 (4.5)
	<i>Shopping Centre</i>	149 (25.0)		6.0 (5.7)		22.8 (4.3)
	<i>Health Centre</i>	52 (8.7)		5.5 (6.0)		22.8 (5.1)
	<i>Other (e.g. airport, resort)</i>	10 (1.7)		5.7 (8.4)		23.4 (5.9)
Geographical Location			<i>p</i> = 0.355	<i>F</i> = 1.09	<i>p</i> = 0.219	<i>F</i> = 1.48
	<i>Capital City</i>	247 (41.5)		5.9 (5.9)		22.7 (4.8)
	<i>Metropolitan Centre (pop: = / > 100 000)</i>	162 (27.2)		5.9 (6.1)		22.4 (4.4)
	<i>Rural location (pop: 5001 - 99 999)</i>	141 (23.7)		6.8 (5.4)		23.3 (4.4)
	<i>Remote (pop: < / = 5000)</i>	45 (7.6)		7.0 (5.7)		23.7 (4.5)
Age			<i>p</i> = 0.064	<i>F</i> = 2.10	<i>p</i> = 0.057	<i>F</i> = 2.16
	< 25 years	26 (4.4)		7.3 (5.0)		24.6 (3.5)
	25 - 34	304 (51.1)		5.7 (5.4)		22.8 (4.4)
	35 - 44	111 (18.7)		6.0 (6.1)		22.0 (4.2)
	45 - 54	81 (13.6)		7.6 (6.4)		23.0 (5.2)
	55 - 64	58 (9.7)		7.0 (6.6)		23.7 (4.8)
	> 65	15 (2.5)		4.9 (6.1)		22.2 (5.2)
Gender			<i>p</i> = 0.01	<i>F</i> = 6.74*	<i>p</i> = 0.004	<i>F</i> = 8.27*
	<i>Male</i>	324 (54.5)		6.8 (5.9)		23.3 (4.5)
	<i>Female</i>	271 (45.5)		5.5 (5.7)		22.3 (4.6)
Frequency of opioid prescriptions			<i>p</i> = 0.006	<i>F</i> = 5.09*	<i>p</i> = 0.001	<i>F</i> = 7.69*
	<i>once daily or less</i>	126 (21.2)		4.8 (5.8)		21.5 (4.7)
	<i>several times daily</i>	355 (59.7)		6.4 (5.7)		23.3 (4.4)
	<i>< 10 times daily</i>	114 (19.2)		7.0 (5.9)		23.1 (4.4)
Years practising pharmacy		<i>Mean 13.6 (SD 11.6)</i>	<i>p</i> = 0.049	<i>r</i> = .081*	<i>p</i> = 0.637	<i>r</i> = .019
Supervised methadone or buprenorphine			<i>p</i> < .001	<i>F</i> = 35.88	<i>p</i> = .003	<i>F</i> = 8.71
	<i>Yes</i>	288 (48.4)		4.74 (5.37)		23.4 (4.7)
	<i>No</i>	307 (51.6)		7.53 (5.95)		22.3 (4.4)
Needle exchange program (NSP)			<i>p</i> < 0.001	<i>F</i> = 18.33	<i>p</i> = .926	<i>F</i> = 0.01
	<i>Yes</i>	220 (37.0)		7.5 (5.7)		22.8 (4.6)

Pharmacy sells syringes (outside NSP)	No	375 (63.0)	5.4 (5.8)	22.8 (4.4)
			$p < 0.001$	$F = 28.351$
			$p = 0.059$	$F = 3.57$
	Yes	294 (49.4)	7.4 (4.9)	23.2 (4.5)
	No	301 (50.6)	5.0 (5.5)	22.5 (4.6)

* $p < .05$

Table 2: Confidence in and willingness to engage in actions related to naloxone supply, comfort with and barriers in supplying naloxone.

How confident are you in your ability to:						
Proactively identify individuals at risk for opioid overdose who would benefit from naloxone						
1. Not at all (%)	2	3	4	5	6	7:
45 (7.6)	86 (14.5)	115 (19.3)	146 (24.5)	131 (22.0)	50 (8.4)	22 (3.7)
Educate patients to recognise opioid overdose and safely administer naloxone when indicated						
1: Not at all (%)	2	3	4	5	6	7:
68 (11.4)	85 (14.3)	111 (18.7)	141 (23.7)	118 (19.8)	58 (9.7)	14 (2.4)
Willingness to:						More Willing (%)
Attend an education and training program on overdose prevention						479 (80.5)
Stock naloxone in the pharmacy						437 (73.4)
Dispense naloxone on a doctor's prescription						537 (90.3)
Supply naloxone on a doctor's standing order (where an individual prescription is not legally required)						398 (66.9)
Proactively identify individuals meeting the criteria for naloxone dispensation under a standing order						290 (48.7)
Initiate the dispensing of naloxone under a protocol with a standing order						314 (52.8)
Dispense naloxone as an over-the-counter medication						243 (40.8)
Educate patients to recognize opioid overdose and administer naloxone						466 (78.3)
Comfort with supplying naloxone to:						Comfortable (%)
an individual with a history of opioid (e.g. heroin) overdose						515 (86.6)
a pain patient being commenced on a trial of opioids						510 (85.7)
an individual with opioid prescription who has a history of substance use disorder						500 (84.4)
an individual with chronic pain who has a high dose opioid prescription						547 (91.9)
an individual on the methadone or buprenorphine program						462 (77.6)
an individual who received an opioid prescription but with a history of smoking, COPD, respiratory illness or obstruction						516 (86.7)
an individual who received an opioid prescription but had a history of renal dysfunction or hepatic disease						476 (80.0)
an individual prescribed opioids who had a concurrent benzodiazepine prescription						494 (83.0)
An individual prescribed opioids who had known or suspected alcohol abuse						480 (80.7)
An individual who purchased syringes at the pharmacy						407 (68.4)
A friend or family member of an individual with a history of opioid overdose or substance abuse disorder						499 (83.9)
A family member of a chronic pain patient who is concerned about opioid side effects						520 (87.4)
Barriers for supply						Frequency (%)
Time to develop, implement and/or sustain the program						424 (71.3)
Lack of training among pharmacy technician staff to implement the program						344 (57.8)
Knowledge regarding my state's laws and regulations regarding naloxone						329 (55.3)
Lack of reimbursement mechanism for patient education and counselling						317 (53.3)
Concerns over clientele who might frequent the pharmacy if a program was in place						226 (38.0)
Complications with payment						190 (31.9)
Not enough profit margin						185 (31.1)
Moral or ethical concerns associated with drug abuse and overdose						136 (22.9)

<i>Support from the manager or pharmacy owner</i>	121 (20.3)
<i>Packaging or stocking the various forms of naloxone</i>	86 (14.5)
<i>Community opposition</i>	60 (10.1)
<i>No anticipated barriers</i>	53 (8.9)
<i>Other (including ability to identify individuals, language, lack of interest)</i>	9 (1.5)

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Table 3: Attitude and support as predictors of services provided, willingness to engage in actions related to naloxone supply and reimbursement

	Attitudes towards harm reduction				Support for overdose prevention			
	Odds Ratio	95% CI	Adj. Odds Ratio *	95% CI *	Odds Ratio	95% CI	Adj. Odds Ratio **	95% CI **
Services								
Opioid Pharmacotherapy (Methadone program, buprenorphine +/- naloxone dosing)	1.09 [#]	1.06 - 1.12	1.09 [#]	1.06-1.12	1.06 [^]	1.02–1.09	1.05 [^]	1.02–1.09
Participates in a needle exchange program	1.07 [#]	1.03-1.10	1.06 [#]	1.03-1.10	.998	.962-1.04	.996	.958-1.03
Sells syringes	1.08 [#]	1.05-1.11	1.08 [#]	1.04-1.11	1.04	.999-1.07	1.03	.988-1.06
Willingness to:								
Attend an education and training program on overdose prevention (online or in person)	1.13 [#]	1.08-1.17	1.14 [#]	1.09-1.19	1.15 [#]	1.10-1.20	1.17 [#]	1.11-1.23
Stock naloxone in the pharmacy	1.14 [#]	1.10-1.18	1.13 [#]	1.09-1.17	1.15 [#]	1.10-1.20	1.15 [#]	1.10-1.20
Dispense naloxone on a doctor's prescription	1.15 [#]	1.09-1.121	1.14 [#]	1.08-1.20	1.16 [#]	1.10-1.24	1.16 [#]	1.09-1.23
Supply naloxone on a doctor's standing order (when an individual prescription is not legally required)	1.15 [#]	1.11-1.19	1.15 [#]	1.11-1.19	1.16 [#]	1.12-1.21	1.17 [#]	1.12-1.22
Proactively identify individuals meeting the criteria for naloxone dispensation under a standing order	1.12 [#]	1.09-1.16	1.12 [#]	1.09-1.16	1.16 [#]	1.11-1.21	1.16 [#]	1.11-1.21
Initiate the dispensing of naloxone under a protocol with a standing order	1.12 [#]	1.09-1.16	1.12 [#]	1.09-1.16	1.15 [#]	1.10-1.19	1.15 [#]	1.10-1.20
Dispense naloxone as an over-the-counter medication	1.13 [#]	1.09-1.17	1.13 [#]	1.09-1.17	1.17 [#]	1.12-1.22	1.17 [#]	1.12-1.22
Educate patients to recognise opioid overdose and safely administer naloxone when indicated	1.10 [#]	1.06-1.14	1.10 [#]	1.06-1.14	1.14 [#]	1.09-1.20	1.14 [#]	1.08-1.19
Reimbursement	$b = -.402^{\wedge}$	-.70 - -.11	$b = -.401^{*\wedge}$	-.70 - -.10 [*]	$b = -.201$	-.59 - .18	$b = -.166^{**}$	-.56 - .22 ^{**}

* controlling for years practising pharmacy, age-group, gender, and frequency of opioid prescriptions, ** controlling for age-group, gender, and frequency of opioid prescriptions: $p < .01$, # $p < .001$

Table 4: Frequency (%) of responses to items assessing knowledge of naloxone (n = 251[^])

How long does Naloxone take to have an effect?				
<i>2-5 min*</i>	<i>6-10 min</i>	<i>11-20 min</i>	<i>21-40 min</i>	<i>Don't Know</i>
126 (50.2)	13 (5.2)	1 (.4)	2 (.8)	109 (43.4)
Where is the most recommended place for non-experts to administer naloxone?				
<i>Outside of thigh/upper arm*</i>	<i>Any vein</i>	<i>By mouth</i>	<i>Don't Know</i>	
97 (38.6)	13 (5.2)	13 (5.2)	128 (51.0)	
How long do the effects of naloxone last for?				
<i>< 20 min</i>	<i>about an hour*</i>	<i>1-6 hours</i>	<i>6-12 hours</i>	<i>Don't Know</i>
14 (5.6)	53 (21.1)	28 (4.7)	13 (2.2)	143 (24.0)
If the first dose of naloxone has no effect a second dose can be given.				
<i>True*</i>	<i>False</i>	<i>Don't Know</i>		
83 (33.1)	13 (5.2)	155 (61.8)		
The effect of naloxone is shorter than the effect of heroin or methadone				
<i>True*</i>	<i>False</i>	<i>Don't Know</i>		
84 (33.5)	22 (8.8)	145 (57.8)		

* indicates the correct response [^]data available for 251 of 595 participants due to a technical database error.

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