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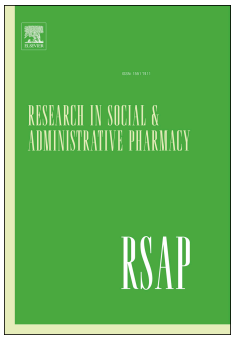

How prepared are pharmacists to provide over-the-counter naloxone? The role of previous education and new training opportunities

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How prepared are pharmacists to provide over-the-counter naloxone? The role of previous education and new training opportunities

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How prepared are pharmacists to provide over-the-counter naloxone? The role of previous education and new training opportunities

Abstract

Introduction and Aims: Opioid overdose can be reversed with timely administration of naloxone. In Australia, naloxone was rescheduled from prescription only (S4) to pharmacist only over-the-counter (OTC, S3) in February 2016, increasing access for the general public. A key barrier to naloxone supply by pharmacists is a lack of knowledge, highlighting the role of pharmacist education. Community pharmacists' education, experience, and training preferences related to naloxone provision, overdose, and substance use disorder were examined.

Methods: Online survey data from a national sample of Australian pharmacists on their educational preferences regarding naloxone and overdose prevention, and prior training on substance use disorder (n = 595) was analyzed using bivariate and multivariate regression analysis. Data from qualitative semi-structured telephone interviews with pharmacists about OTC naloxone provision (n=21) was analyzed using thematic analysis.

Results: Most pharmacists (81%, n = 479) were willing to be trained in opioid overdose prevention, with greater willingness to attend training associated with younger age, being female, fewer years of practice, not having attended previous education on substance use disorder, and higher confidence in issues relating to substance use disorder. Qualitative interviews confirmed community pharmacists' willingness to attend training but analysis revealed low awareness, knowledge, and confidence about naloxone and preventing opioid overdose. Most pharmacists preferred online training or webinars.

Discussion and Conclusion: Most community pharmacists in Australia are willing to attend training on providing naloxone and preventing opioid overdose. There are opportunities to develop and expand the online presence of training, guidelines, and education materials to facilitate the expanded supply of OTC naloxone.

Key words: naloxone; education; pharmacists; substance use disorder; opioid use; health communication

Introduction

Deaths from opioid overdose are increasing, yet opioid overdose can be reversed with timely administration of naloxone (1, 2). Naloxone is recommended to be widely available by the World Health Organization (3), with the intention that it is administered at a later time by a trained layperson who witnesses an overdose (also known as 'take-home' naloxone, or THN). Internationally, pharmacists are recognized as potential educators and distributers of naloxone to the community (4, 5) but few countries are yet to widely distribute naloxone in this setting. According to available literature only Italy, Australia and some US states have naloxone available without a prescription (1). To maximize naloxone availability through pharmacies the experiences and attitudes of pharmacists on their new roles as distributers of naloxone in the community need to be better understood.

In February 2016 in Australia, naloxone was rescheduled from prescription only (S4) to pharmacist only over the counter (OTC, S3) (1), yet OTC naloxone has not been widely taken up by community pharmacies. Previously in Australia, patients needed a prescription from their general practitioner either via traditional medical appointments, or though attendance at a specialised overdose prevention training workshop (1, 6). The rescheduling required a change to the *Standard for the Uniform Scheduling of Medicines and Poisons* legislation administered by the Australian Therapeutic Goods Administration (TGA) in order to 'down-schedule' naloxone from its existing Schedule 4 status as a 'prescription only' medicine to a 'pharmacist only' (Schedule 3) medicine. Schedule 3, or OTC medicines, are stored behind the counter and a pharmacist must be involved in the sale to ensure safe use of medicines. The down-scheduling enables pharmacists to initiate naloxone supply and allows members of the public to request naloxone from pharmacies.

In Australia, opioid overdose deaths have increased each year since 2006, with a 64% increase in overdose deaths in the ten years leading up to 2015 (9). On a global level, Australia has a higher than average drug mortality rate with opioids being the leading cause of drug-related death (10). In most cases, these deaths are accidental and preventable and population level responses are required to reverse these concerning trends. The rescheduling of naloxone in Australia recognises the potential role of pharmacists in overdose prevention including as educators and distributers of naloxone (4, 5, 11, 12).

A scoping review and Australian national online survey of pharmacists completed in 2015 revealed that community pharmacists hold positive attitudes towards provision of illicit

drug-related harm reduction services, including naloxone supply (7, 8). Yet few pharmacists appear confident in their ability to identify and train patients in administering OTC naloxone (8). Furthermore, many pharmacists have limited knowledge of naloxone, highlighting the importance of education in this area (8).

To better understand the educational needs and preferences of pharmacists around naloxone supply a mixed-methods study (online survey and qualitative interviews) of community pharmacists' preferences for provision of naloxone to people at risk of opioid overdose, their family, and friends was conducted. To gain further insight into the findings from the online survey data, qualitative interviews examined pharmacists' behaviors and preferences for opioid overdose prevention training, and explored facilitators and barriers to training on OTC naloxone. Three questions were addressed:

1. How does previous experience with substance use disorder (SUD) training and treatment provision influence current (i) confidence and (ii) willingness to supply naloxone?
2. What factors influence pharmacist's willingness to participate in opioid overdose prevention training?
3. What are pharmacists' preferences for training delivery?

Methods

Using a sequential explanatory mixed methods design (13), community pharmacists' education needs in relation to naloxone and overdose prevention was investigated using two data sources:

1. Quantitative data from an existing national online survey (n = 595); and
2. Qualitative telephone interviews with a sample of those who participated in the national online survey (n=21).

Qualitative data were used to explore, in greater depth, findings from the quantitative national survey, providing validation of key findings and context to the survey results (14).

National online survey

Previously unreported data from a national online survey undertaken in September–November 2015 (8) was analyzed. This study aimed to recruit a nationally representative sample of 10% of community pharmacies. Pharmacies were contacted by phone with the pharmacist-in-charge or pharmacist manager invited to participate, with a request to provide an email address. We sought to have one pharmacist (the pharmacist in charge) to represent the situation in each pharmacy to avoid multiple responses per pharmacy. Where pharmacists were willing to receive further information, an invitation email was sent which included a link to the participant information statement and online survey. With a response rate of 45%, 595 community pharmacists participated in the survey, representing 11% of the 5,450 operating pharmacies in Australia (8) (see Figure 1 for recruitment flow). The online survey was designed to take fewer than 20 minutes to complete (mean completion time was 26.6 minutes, median 18.7 minutes).

Pharmacists were reimbursed AUD$40 for completing the survey. This quantitative study was approved by the University of New South Wales Human Research Ethics Advisory (HREA) Panel: Social and Health Research (HC15556).

Measures

Four age groups (less than 25 years of age, 25-34 years old, 35-54 years and 55 years and above), gender, years of practice and further education about SUD after graduating were examined. All were examined as binary variables, except for years of practice which was examined as a continuous variable.

Geographic location was classified as capital city, other metropolitan urban center (population equal to or greater than 100,000), rural location (population between 5,000 to 99,999) and remote area (population less than or equal to 5,000). Rural and remote categories were collapsed, as there were fewer respondents in these categories.

Previous experience with SUD training and confidence to supply naloxone were examined as binary variables. Current provision of opioid substitution treatment (OST) and whether the pharmacy stocked naloxone were examined as binary variables.

Confidence in ability to educate patients to recognize opioid overdose and safely administer naloxone was measured using a 7-point scale where 1 = “not at all confident” and 7 = “extremely confident”.

Willingness to educate patients to recognize opioid overdose and safely administer naloxone, and to attend training were both rated by participants on a 4-point scale from “already doing this” to “not at all willing to do this”. Responses were collapsed into a binary variable where participants who were “already doing this activity” and “extremely willing to do this activity” formed one group, while “somewhat willing to do this” and “not at all willing to do this” formed the other. This was due to low response numbers in the outer most two options (n<10).

Preferred format of training was examined. Seven options were offered: “face-to-face (one-to-one)”, “online”, “webinar”, “both online and face-to-face”, “would not like to receive training”, “face-to-face (group)” and “written”.

The time willing to spend receiving education about naloxone was offered as six groupings: “less than 5 minutes”, “between 5-15 minutes”, “between 16-59 minutes” “between 1-2 hours”, “up to 4 hours”, and “more than 4 hours”.

Data were descriptively analyzed to examine pharmacists’ previous continual professional education (CPD) and their willingness, time and preferences for training relating to OTC naloxone supply. Ordinal logistic regression was used to assess the associations with pharmacists confidence to educate patients in opioid overdose and administering naloxone. Multivariable logistic regression analyses were conducted with dependent variables: willingness to educate patients regarding opioid overdose and administering naloxone and willingness to participate in training. Independent variables explored were OST provision, and previous SUD training, adjusting for pharmacists’ demographic characteristics,

confidence and experiences with naloxone. Pharmacists preferences around naloxone training were descriptively explored. All analyses were conducted using SPSS Version 23.

Qualitative telephone interviews

Pharmacists who had participated in the national survey who indicated interest in participating in further research were contacted by email and invited to participate in a short telephone interview, in addition to promoting the study through professional networks.

We interviewed 21 community pharmacists from three states in Australia, Victoria (n=6), New South Wales (n=10) and Queensland (n=5). We purposively recruited for variation according to gender, age, geographic diversity as well as provision of harm reduction services. Around half (11 of 21) were female; six were aged 20-29 years, nine were 30-39 years and six were aged over 40 years. Most (16 out of 21) were from metropolitan locations (as opposed to regional or rural), eight provided Needle Syringe Program (NSP) services, and 11 provided OST services.

All procedures were approved by University of New South Wales HREA Panel G: Health, Medical, Community and Social (HC16598) and UQ School of Pharmacy Ethics Committee (Ref: 2016/7, #2016001381).

Interviews were used to explore community pharmacists' experiences of and attitudes to providing OTC naloxone. Topics included: the role of pharmacists supporting people at risk of opioid overdose; knowledge of and attitudes to OTC naloxone provision; and required information or training. This paper is focused on their accounts of naloxone training, willingness to receive future training, as well as training preferences. Pharmacists were interviewed over the telephone using a semi-structured interview guide. A brief survey was used to collect basic demographic information.

Interviews took 30-45 minutes. Pharmacists chose whether to be reimbursed AUD$50 for their time and contribution to research or to donate AUD$50 to one of three charities. Data were collected between September 2016 and December 2016.

Interviews were digitally recorded and professionally transcribed. Transcripts were de-identified and data were analysed in NVivo 11 software using a thematic analysis

approach (14, 15). Preliminary analysis, including the development of a preliminary codebook, was conducted by author KLJC guided by the research questions above. Following the steps outlined by Braun and Clarke (15), coding and analysis of the full dataset was completed by author AO. Transcripts were read and re-read, comparing interviews for similarities and differences. Transcripts were then coded systematically to establish themes. This manuscript focusses on the findings relating to previous experiences of SUD training, confidence and willingness to supply naloxone, attitudes to training and preferences for training delivery.

Please see supplementary material for full details of questions asked in the online survey and qualitative interviews.

Results

Participant demographics.

Table 1 displays the descriptive statistics for the survey participants. The 595 respondents were roughly split evenly between males and females (54% and 46%, respectively). Respondents had been practicing for a median of 9 years (IQR: 5-21 years) with approximately half receiving training on SUD after graduating (n=288, 48%) and currently providing OST services (n=307, 52%). Despite the majority of pharmacists having heard of naloxone being used in the community for opioid reversal (n=425, 71%), only around a quarter were aware of naloxone being stocked in their pharmacy (n=136, 23%).

Associations with confidence and willingness to educate patients on opioid overdose and naloxone administration.

The majority of survey participants were either already (n=10, 2%) or extremely willing (n=471, 76%) to educate patients on opioid overdose recognition and safe naloxone administration, while the median confidence level was average (4 out of 7), with two thirds (62%) of pharmacists falling between 3 and 5 (1 being 'not at all confident' and 7 being 'extremely confident"). Confidence was associated with gender (OR 1.91, 95%CI 1.43, 2.57) with males being more confident than females (Table 2). Provision of OST services, number of years practicing and confidence to educate were all associated with willingness to educate patients on overdose risk (Table 3). Pharmacists already providing OST services were more willing (OR 1.65, 95%CI 1.07, 2.53) as were those who were confident to educate (OR 1.45, 95%CI 1.27, 1.67). Pharmacists who had been practicing for longer were less willing to educate patients in opioid overdose and naloxone administration (OR 0.97, 95%CI 0.95, 0.99). No association was found between previous education on SUD for either willingness or confidence, whilst OST provision had no effect on confidence.

Pharmacists' willingness to attend training on naloxone and overdose prevention

Few pharmacists interviewed in the qualitative study had attended any naloxone specific training and most seemed unaware of resources or training available to assist them in providing OTC naloxone. This is illustrated in the following quotations.

I don't really know much at all. I tried to have a look at the PSA [Pharmaceutical Society of Australia] guideline for OTC naloxone, but I'm not a member of PSA, so I couldn't get the guidelines, otherwise I would have had a read of that to see what pharmacists can do. (Female, 30-39 years, Regional Pharmacy NSW)

I only receive the training how to do the opioid substitution program from my own boss, but I haven't heard anything about naloxone actually from him. (Male, 20-29 years, Metro NSW)

… because we don't get asked for it [naloxone]. For us… I don't really know because I haven't done it [training]. (Female, 40-49 years, Remote NSW)

Overall, most pharmacists who participated in the survey were extremely willing to attend (n=471, 79%) or had already completed training about naloxone (n=8, 1%). Analysis of the survey data shows that particular demographic characteristics were associated with their willingness to attend education on opioid overdose prevention (Table 4). Pharmacists who had had previous education on SUD were almost twice as willing to attend training (OR 1.94, 95%CI 1.23, 3.06) than those who had not. Males were half as likely to be willing attend (OR 0.44, 95%CI 0.28 , 0.70) than females.

Each year of increased practice experience was associated with reduced odds of being willing to attend training (OR 0.96, 95% CI 0.95, 0.98). Pharmacists who were confident about educating patients in opioid overdose and administration of naloxone were significantly more willing to attend training (OR 1.31, 95% CI 1.14, 1.50). No association was found between willingness to attend training and current provision of OST or geographical location of pharmacy.

While most pharmacists were willing to attend training on opioid overdose prevention or naloxone provision, some were reluctant. Analysis of the qualitative interview data suggests that this may be, in part, because some pharmacists believe that people living with SUD are a problematic client group, and that naloxone provision is best provided in services specifically catering for people living with SUD rather than community pharmacies. The following quotations highlight these concerns.

> *See, the issue is like dealing with those types of people overdosing. I'm not trying to stereotype or anything, but … this type of people are not really easy to handle or to manage … I believe not every pharmacist is going to do it. So if we make it obligatory … we are obliging every pharmacist to manage or to handle this type of medical condition or this type of patients, which is not easy for every pharmacist or for every type of pharmacy. (Male, 40-49 years, Metro NSW)*

> *I think if a patient is on an opioid replacement program, there should be some kind of educator in the methadone clinic or the doctor to explain the importance of [naloxone]… (Male, 20-29 years, Metro NSW*)

Despite these expressed concerns, qualitative interviews confirmed that most pharmacists were willing to attend training, and those already involved in OST were notably positive about extending harm reduction efforts to include naloxone supply.

> *I mean, if you are willing to engage in the pharmacotherapy [OST] program, the hope is that you would be willing to engage in … harm minimization … it sort of goes hand in glove with what you are already doing. So you'd hope that it's not too much of a burden. A lot of people engage in that sort of training anyway and it's nice to keep the knowledge up. (Male, 20-29 years, Metro Victoria)*

Preferred mode of delivery for training

More than two thirds of the survey respondents had a preference for between 5 and 59 minutes (n=413 of 595, 69%), while fewer (n= 157 of 595, 26%) were willing to spend more than one hour on naloxone training (Table 5). Responses from interview participants on time willing to spend on naloxone training varied from less than five minutes to more than four hours. Pharmacists expressed availability constraints during working hours. Furthermore, they were reluctant to spend time on training unless the education session was counted towards their continuing personal development (CPD) points or there was a financial incentive associated with counselling and distribution of naloxone from pharmacies.

> *If it is a rep from a company, I would like to spend about 10-15 minutes with him, because basically that is the time that you need to counsel a patient with the naloxone too.* (*Male, 20-29 years, Metro NSW)*

In terms of mode of delivery, most pharmacists completing the survey preferred online/webinar training (n = 328, 55%), or face-to-face training (n = 253, 45%). Fourteen (2%) participants did not express a preference between face-to-face or online training: three (<1%) indicated a preference to attend both online and face-to-face training, six (1%) preferred written training and five (<1%) did not wish to attend any training at all (Table 4). In addition to their primary choice of training delivery, 32 respondents provided additional comments. The most common comment cited additional or multiple preferences (n=19), 6 stated face to face would be ideal but is often impractical (especially for rural pharmacists), 4 suggested supplementary written or online material for later review and 3 highlighted the importance for interactive sessions/ ability to ask questions.

Responses from interview participants on preferred mode of delivery also varied. Some indicated that they engaged in self-learning (such as reading articles and guidelines and watching webinars), others expressed desire for structured training activities (such as formal workshops and training modules), while still others noted a lack of time and preference for short demonstration training (such as short one-on-one demonstrations from drug company representatives or online videos). The following quotations illustrate the diversity of training preferences.

> *A video would be nice to watch at home in your free time and it's flexible. (Female 20-29 years, Metro NSW)*

> *Journals are also good, because we can read in our spare time. (Female 20-29 years, Metro NSW)*

> *I don't really have a lot of time to get to face to face training so … I don't mind online and ideally when you are looking at a case study and an interaction like actually seeing a video of different examples of appropriate or inappropriate ways to go about it. (Male 30-39 years, Metro Victoria)*

Most suggested that the Pharmacy Guild, PSA and/or pharmaceutical companies were possible or preferred providers of the education.

I would like the PSA and the Guild to actually get behind it and actually do some training. (Male 50-59 years, Regional NSW)

I prefer if there is a representative from naloxone company to visit the pharmacies to give some education that will be awesome. (Male 20-29 years, Metro NSW)

Leaflets with diagrams and videos demonstrating naloxone administration, as well as counselling skills were considered to be helpful resources. Interviewees said there is a need for a PSA protocol or Pharmacy Guild guideline to supplement any training, providing a step-by-step guide in when to supply or not to supply OTC naloxone.

Discussion

This mixed-methods study of Australian community pharmacists shows that most pharmacists are willing to receive training on the provision of OTC naloxone and opioid overdose. Preferences for online and face-to-face training were about equal. Responses from pharmacists also indicated that they are largely unaware of existing training resources, highlighting the urgent need for widespread education if the potential for community pharmacy supplied naloxone is to be realized. This research suggests that training around naloxone is not easily accessible for pharmacists. We are aware of an online training module offered by the Pharmaceutical Society of Australia, however the webinar is only available to members. We are also aware of targeted naloxone training programs for health professionals in the state of Victoria. This is particularly important as Australian community pharmacists are bound by the Standards for the Provision of Pharmacy Medicines and Pharmacist Only Medicines in Community Pharmacy which includes the need for "[A]ll staff members who supply Pharmacy Medicines and Pharmacist Only Medicines receive initial and ongoing training on products, services, and procedures relevant to their supply".

In addition, there needs to be a consistent approach to naloxone training (for community members and professionals). Education workshops delivered in the United States highlight the importance of multi-disciplinary care and emphasize pharmacists' involvement as part of the overall patient care in opioid overdose prevention (16, 17). One strategy would be to establish a national program, as has been achieved in Scotland, where training and distribution is coordinated across multiple community outlets (e.g., drug user organizations, drug treatment services, pharmacists) in order to maximize the reach of these initiatives (18).

Results from this study also suggests that promotion and education are needed to attract those pharmacists who are less confident in working with those living with SUD. Those already involved with harm reduction on some level (providing OST or stocking naloxone) were most interested in further training. Willingness to attend training was also associated with prior post-graduation training in SUD and fewer years of experience. However, pharmacists' confidence in recognizing opioid overdose and supplying naloxone was generally low (including among those with prior post-graduation training on SUD and

with more years of experience). suggesting that that more general SUD training could be updated to include naloxone but also that training efforts on THN need to be widespread. .

Pharmacists expressed a range of preferences around how they might receive training. Professional pharmacy organizations and pharmaceutical companies would be the preferred or expected providers of any new educational initiatives. The role of professional organizations in leadership and creation of training and guidelines is important in practice change in pharmacy (17, 19). Respondents noted the value of a PSA protocol or Guild guideline to supplement the training, providing a step-by-step guide in when to supply or not to supply OTC naloxone. Pharmacists appeared either unaware, or unable to access, existing resources on naloxone potentially because they require membership to pharmaceutical societies to retrieve the resources, or because the availability of the resources have not been heavily promoted. Visual training aids and counselling skills were considered helpful resources. Visual, hands-on training is useful for learning about a drug that requires intramuscular administration. A range of resources exist in Australia developed by groups other the pharmaceutical industry and related professional organizations (20). However, these do not appear to be used as a source of information by pharmacists. Further, there may be a need to expand current training resources as recent research reviewing the content of naloxone training for pharmacists highlighted the importance of educating pharmacists on *how* to communicate about naloxone with patients, in addition to what information should be communicated (21). In light of low uptake of THN from community pharmacies, training that addresses communicate on these sensitive issues may be a way to improve naloxone supply in pharmacy practice. We note that pharmaceutical companies traditionally address this need. However, with no patented naloxone product consistently available at the time of the study, this had not occurred. With the emergence of new intranasal naloxone formulations this may change (22).

Time is a common barrier when seeking to train professionals (17, 23-26). Most pharmacists preferred a short duration of training - no more than one hour. Accredited training that can be counted towards pharmacists' mandatory training requirements is one strategy that may help to overcome time barriers experienced by most pharmacists, since it is a professional requirement to allocate time to accredited training.

The availability of pharmacist training alone is unlikely to address challenges in expanding naloxone supply. The low availability of naloxone (in less than one in four pharmacies surveyed) supports that there is enormous potential to increase pharmacy involvement in this area. Furthermore, public knowledge of OTC naloxone availability needs to be enhanced in order to increase the number of patients requesting the medicine in pharmacies. Current research suggests that among people who inject drugs there has been an increase in awareness of naloxone (27). However among the other target patient group, those prescribed opioids, there is low awareness of naloxone and overdose risks in general (28).

Population level responses are required to reverse the increasing number of opioid overdoses. The increasing number of opioid overdoses in Australia include pharmaceutical opioids as well as heroin. As the primary distributers of pharmaceutical opioids in our communities, pharmacists are increasingly being recognised as potential educators and distributers of naloxone (4, 5, 11, 12). The down - scheduling enables members of the public to request naloxone from pharmacies but also for pharmacists to initiate naloxone supply. Training and supply issues identified in this study suggests that pharmacists require more support if their potential role in overdose prevention is to be realised.

Limitations

There are some limitations to consider in interpreting these findings. Not all pharmacists responded, though from our random sample, participant demographics represented that pharmacists were broadly representative. Females in this sample were slightly underrepresented with females representing 61% of registered pharmacists in Australia as of September 2015 (22). The distribution of pharmacists by state and age was representative of the national distribution (22). There is the potential for social desirability bias relating to self-reported data. To minimize this effect data collection for the online survey was anonymous and participants from interviews were informed that their data would be de-identified (8, 29). The question examining further training in substance use disorders was limited in that we did not capture details on the extent of the training, or when it occurred. Future studies may capture greater detail to allow a more detailed examine of this aspect. Further, the qualitative project sample was self-selected and findings may not be generalizable across all pharmacists. Finally, the online data were collected prior to rescheduling, and the qualitative data were collected after, meaning that

those pharmacists in the qualitative study had greater opportunity to hear about naloxone. The low knowledge in both samples suggests that this was unlikely to have influenced results.

Conclusion

Most Australian pharmacists are willing to attend training on opioid overdose and naloxone provision. Most pharmacists did not report high levels of confidence in their ability to recognize opioid overdose and supply naloxone, irrespective of previous SUD training, suggesting there is a need for targeted training on naloxone. Based on the preferences of pharmacists, training should be short and offered in a range of modalities (online and face-to-face). National pharmacy organizations are ideally placed to provide leadership on education. Given the importance of naloxone as one strategy to address rising opioid-related mortality, there is an urgent need to better coordinate training and delivery of the naloxone.

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Table 1. Survey participant demographics

Demographic	Frequency (%) N=595
Gender	
Male	324 (54.45%)
Female	271 (45.55%)
Age	
Less than 25 years	26 (4.37%)
25-34 years	304 (51.09%)
35-54 years	192 (32.27%)
55 years and above	73 (12.27%)
State	
Victoria	120 (20.17%)
Tasmania	16 (2.69%)
New South Wales	226 (37.98%)
Queensland	110 (18.49%)
Northern Territory	5 (0.84%)
Western Australia	63 (10.59%)
South Australia	45 (7.56%)
Australian Capital Territory	10 (1.68%)
Geographical Location	
Capital City	247 (41.51%)
Other Metropolitan Urban Centre	162 (27.23%)
Remote or Rural	186 (31.26%)
Had received previous training on SUD	288 (48.40%)
Currently provides OST services (methadone, buprenorphine or suboxone dispensing)	307 (51.60%)
Pharmacy currently stocks naloxone	136 (22.86%)
Heard of Naloxone being used to reverse effects of opioids	425 (71.43%)
Number of Years in Practice[a]	9 (5 – 21)

[a] median and interquartile range presented. SUD=substance use disorder, OST=opioid substitution therapy

Table 2. Associations with confidence to educate on opioid overdose and naloxone administration

Variable	Adjusted Odds Ratio	95% Confidence Interval
Have received further education about substance use disorders after graduating		
No previous training	REF	-
Had previous training	1.14	(0.842 – 1.531)
Currently providing OST services		
Does not provides OST	REF	-
Currently provide OST	1.31	(0.978 – 1.756)
Gender		
Female	REF	-
Male	1.91***	(1.426 – 2.569)
Year of Practice		
	0.996	(0.983 – 1.009)
Geographic Location		
Capital City	REF	-
Other Metropolitan	0.93	(0.656 – 1.321)
Rural or Remote	0.88	(0.624 – 1.238)
Whether the pharmacy stocks naloxone		
Does not stock naloxone	REF	-
Currently stocks naloxone	0.985	(0.699 – 1.389)

*=P<0.05, **=P<0.01, ***=P<0.001, OST=opioid substitution therapy, REF=reference group

Table 3. Associations with willingness to educate on opioid overdose and naloxone administration

Variable	Adjusted Odds Ratio	95% Confidence Interval
Have received further education about substance use disorders after graduating		
No previous training	REF	-
Had previous training	1.21	(0.783 – 1.869)
Currently providing OST services		
Does not provides OST	REF	-
Currently provide OST	1.65*	(1.072 – 2.531)
Gender		
Female	REF	-
Male	1.14	(0.743 – 1.739)
Year of Practice		
	0.97***	(0.953 – 0.987)
Geographic Location		
Capital City	REF	-
Other Metropolitan	1.18	(0.723 – 1.915)
Rural or Remote	1.90*	(1.120 – 3.224)
Whether the pharmacy stocks naloxone		
Does not stock naloxone	REF	-
Currently stocks naloxone	0.94	(0.571 – 1.565)
Confidence in ability to educate patients to recognize opioid overdose and safely administer naloxone		
	1.45***	(1.263 – 1.670)

*=P<0.05, **=P<0.01, ***=P<0.001, OST=opioid substitution therapy, REF=reference group

Table 4. Associations with willingness to attend training on overdose prevention

Variable	Adjusted Odds Ratio	95% Confidence Interval
Have received further education about substance use disorders after graduating		
No previous training	REF	-
Had previous training	1.94**	(1.234 – 3.063)
Currently providing OST services		
Does not provides OST	REF	-
Currently provide OST	1.09	(0.703 – 1.692)
Gender		
Female	REF	-
Male	0.445***	(0.281 – 0.702)
Year of Practice		
	0.965***	(0.948 – 0.982)
Geographic Location		
Capital City	REF	-
Other Metropolitan	1.22	(0.726 – 2.055)
Rural or Remote	1.48	(0.881 – 2.500)
Whether the pharmacy stocks naloxone		
Does not stock naloxone	REF	-
Currently stocks naloxone	1.88*	(1.069 – 3.296)
Confidence in ability to educate patients to recognize opioid overdose and safely administer naloxone		
	1.31***	(1.136 – 1.505)

*=P<0.05, **=P<0.01, ***=P<0.001, OST=opioid substitution therapy, REF=reference group

Table 5. Distribution of pharmacist's preferences for mode of delivery and length of training

Mode of Delivery	Frequency (%) N=595	Length of Training	Frequency (%) N=595
Face to Face (one on one)	102 (17.14%)	Less than 5 minutes	25 (4.20%)
Face to Face (group)	151 (25.38%)	Between 5-15 minutes	182 (30.59%)
Online	281 (47.23%)	Between 16-59 minutes	231 (38.82%)
Webinar	47 (7.90%)	Between 1-2 hours	123 (20.67%)
Written	6 (1.01%)	Up to 4 hours	20 (3.36%)
Both online and face to face	3 (0.50%)	More than 4 hours	12 (2.35%)
Would not like to attend	5 (0.84%)		

Figure 1a- Recruitment to online survey

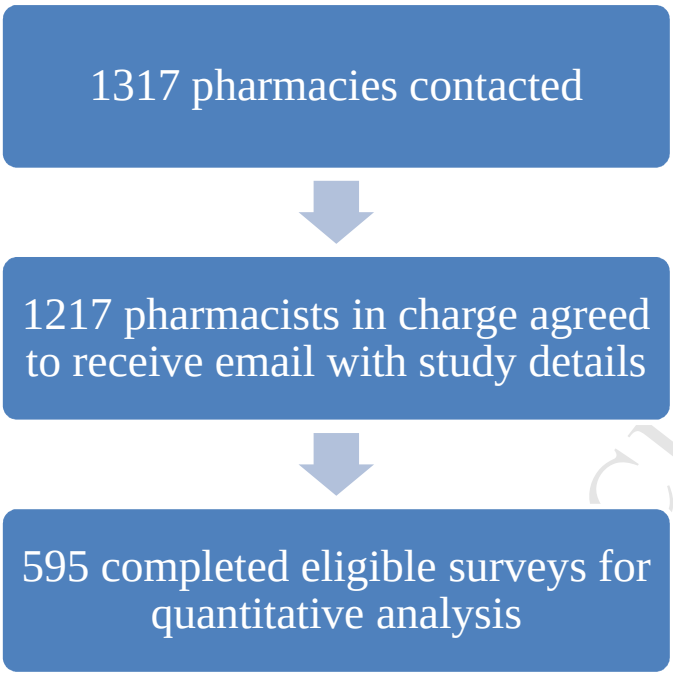

Figure 1b – Recruitment to qualitative interviews