Exploration of pharmacist comfort with harm reduction behaviors: Cross-sectional latent class analysis

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ABSTRACT

Background: Pharmacists are positioned to play important roles in implementing evidence-based prevention and harm reduction approaches for opioid misuse and related healthcare outcomes such as HIV and hepatitis C. More research is needed to understand how best to facilitate harm reduction practices among pharmacists.

Objectives: This hypothesis-generating study investigated 1) whether subgroups (latent classes) were observable among pharmacists based on self-reported comfort with specific harm reduction behaviors; 2) whether having reported expertise in key content areas was associated with any latent classes that might be identified; and 3) whether comfort and training were associated with actually having dispensed syringes for likely non-prescription drug use.

Methods: This was a statewide census of community managing pharmacists in Arizona conducted from December 2018 to May 2019. Participants reported their degree of comfort with 10 harm reduction behaviors, their expertise (recent continuing education and/or specialization) in selected content areas, and their syringe dispensing behavior. Additional sociodemographic information was also collected. Subgroups related to harm reduction were computed using latent class analysis, and associations between study variables were assessed with Fisher's Exact Tests.

Results: Data suggested the existence of four latent, comfort-based harm reduction classes: high comfort, moderate comfort, clinical comfort, and opioid prevention only. Reported expertise in pre-exposure prophylaxis for HIV (PrEP) was likely associated with harm reduction class. However, class membership was not associated with reporting having dispensed non-prescription syringes, though the single comfort item for syringe dispensing, by itself, was associated therewith.

Conclusion: Comfort with harm reduction likely clusters, so pharmacists may be broadly comfortable with “topics” or “methods” of harm reduction; however, comfort with a specific harm reduction pharmacy practice may be a better predictor of engaging in that behavior than harm reduction comfort class. On the other hand, strategies to improve comfort, such as intervention development, might successfully be informed by pharmacists’ latent class.

BACKGROUND

Provisional data published by the US Centers for Disease Control and Prevention (CDC) indicate there was a 30.4% increase in drug overdose deaths from February 2020 to February 2021, culminating in a total of 95,133 such deaths.[1] Those national data reinforce local reports of similar issues, such as recent, preliminary evidence from Ohio of a new wave of opioid-related harm.[2] Given this concerning shift, it is clear that the drug overdose crisis continues to present a serious threat to health and wellbeing, and it remains imperative to understand how best to support our healthcare infrastructure in seeking to improve the lives of its patients and clients. In a recent essay, Dr. Nora Volkow, Director of the National Institute on Drug Abuse (NIDA), indicated evidence-based harm reduction was a key component of an effective national response to this issue.[3]

Harm Reduction in Community Pharmacies

In the context of psychoactive substances, “harm reduction is a set of… strategies and ideas aimed at reducing negative consequences associated with drug use.”[4] Although non-profits and other organizations have articulated clear principles of harm reduction,[4] defining harm reduction practices and beliefs for research or field-specific practice can be complex. In the pharmacy profession, harm reduction practices have included, but have not been limited to, naloxone dispensing and education for the prevention of overdose,[5-7] pharmacy syringe sales for the prevention of blood-borne infections and other health sequelae,[8,9] and efforts to educate

pharmacists about substance use and substance use disorders.[10] A 2016 agreement by 94 schools and colleges of pharmacy supported the use of evidence-based prevention programs grounded in harm reduction, namely prescription drug monitoring, prescriber education, medication-assisted treatment, safe drug disposal, and overdose prevention through naloxone.[11] Harm reduction pharmacy practice has also extended to sexual health, including dispensing pre-exposure prophylaxis (PrEP) for human immunodeficiency virus (HIV) prevention[12] and offering pharmacy-based HIV testing.[13]

There are multiple reasons why it is important to study pharmacists' role in harm reduction. For many patients, as the COVID-19 pandemic has highlighted, community pharmacies are often the first and last point of contact within the healthcare continuum.[14] One recent study of more than 600,000 Medicare beneficiaries found that patients in all 50 states had more community pharmacy visits than primary care visits, and that the difference was especially pronounced in rural areas.[15] Indeed, the relative ubiquity of community pharmacies along with the high level of professional training undertaken by pharmacists has led some scholars to conclude that community pharmacies are ideal and potentially under-leveraged resources in addressing the opioid overdose epidemic and related health outcomes such as HIV and hepatitis C,[16] which often co-occur and may benefit conjointly from harm reduction approaches.[17]

At the same time, while the overall national prevalence of community pharmacies is high, their distribution is uneven, and some counties have no community pharmacy.[18] A study in North America and Europe found that high community poverty rates were associated with reduced medication access and lower likelihood of having a nearby chain pharmacy, and that even when community pharmacies were present in an impoverished community, they were more likely to have limited stock.[19] In such cases, an emphasis on harm reduction is arguably even more

important, as it may mitigate already exacerbated barriers to access for medications like naloxone, or services like point-of-care testing.[20]

Pharmacist Comfort with Harm Reduction

Pharmacist comfort with harm reduction behavior has often been studied in the context of naloxone dispensing. Regional studies within the United States (US) have indicated heterogeneity in terms of pharmacist comfort dispensing naloxone,[21,22] though, especially in the US, the date of survey administration relative to state legislation about naloxone may contribute to variability.[6] Some studies have found associations between knowledge about naloxone and comfort dispensing.[21] At the same time, comfort with a behavior like naloxone dispensing is likely complex and may be difficult to improve with continuing education about naloxone alone,[23] though pharmacy leaders in some cases perceive that staff training, even when done informally, can improve the dispensing environment.[24] Heterogeneity in comfort with harm reduction has also been observed internationally; Australian community pharmacists were generally comfortable dispensing naloxone but there was variability of greater than 20% depending on the description of the individual receiving the medication.[25]

Some research has indicated that comfort discussing naloxone is associated with whether community pharmacists offer it to clients,[26] but this may not hold true universally for all harm reduction approaches and associated behaviors. For example, in the same sample of pharmacists, comfort with dispensing syringes was associated with syringe sales to people who inject drugs,[27] and comfort dispensing PrEP was associated with dispensing PrEP to anyone with a medical need or prescription,[12] but comfort dispensing naloxone was not associated with naloxone dispensing.[28] It may be the case that other mediating variables underlie the relationship between comfort and behavior, such as patients' concerns about stigma or pharmacists' direct or indirect expressions of stigma,[29] which also likely vary by harm reduction

approach (e.g., a recent qualitative study of 37 current or former injection drug users in Arizona found that all of them had been refused syringe sales at a pharmacy and had experienced stigmatizing interactions with pharmacy staff members[9]).

OBJECTIVES

In this study, we conducted a statewide census of community managing pharmacists in Arizona to better understand the harm reduction landscape in community pharmacies. At the time the study was conducted, Arizona considered syringes to be drug paraphernalia in most cases (though syringe service programs have since been legalized via SB 1250[30]) and pharmacists were permitted to dispense naloxone to "any individual" under a standing order.[31]

We had three distinct but interrelated objectives. 1) Once we obtained the data, we conducted an exploratory latent class analysis (LCA) to determine whether subgroups were observable among pharmacists based on self-reported comfort with specific harm reduction behaviors. The LCA procedure is designed to detect unobserved (latent) groups of respondents based on their patterns of responses to indicator variables; each participant is assigned a probability of belonging to each class based on their personal responses.[32] 2) We then investigated whether self-reported expertise in key content areas, such as motivational interviewing, was associated with pharmacists' latent class assignment. 3) Finally, we assessed whether latent class assignment and reported expertise were associated with actually having dispensed syringes for likely non-prescription drug use (a key example of pharmacy harm reduction practice). This study was intended to be hypothesis-generating and to support the burgeoning literature on pharmacists' role in the US harm reduction infrastructure.

METHODS

Procedures

This study was a survey-based census of community managing pharmacists in Arizona. In keeping with a standard understanding of these entities in the US, we conceptualized a "community pharmacy" as a setting where the public can obtain medications at the standard retail cost. These entities typically operate in food stores, as chains, as independent providers, or in mass merchandising settings.[33] Surveying managing pharmacists is an approach our study team first used in 2016.[34] Among other benefits, this method allows data to be collected from each community pharmacy in a region without the variability that might be introduced by different roles within the pharmacy (e.g., non-managers or technicians) responding to the survey.

In December 2018, a paper invitation to a 30-item online survey and a $5.00 cash pre-incentive were mailed to all 807 community managing pharmacists in Arizona listed by the Hayes Database and the Arizona State Board of Pharmacy. The number of pharmacists identified for the study was arrived by manually evaluating the databases and removing 191 pharmacies that were not community pharmacies (but were other types of pharmacies) from the original list of 998 pharmacies. The invitation letter contained an URL and QR (quick response) code leading to a survey landing page in the Qualtrics survey platform. Each respondent was provided with a unique passcode to access the survey, and passcodes were linked to pharmacy identity, the latter of which respondents were also asked to verify. This method has been found to consistently produce response rates greater than 30% among Indiana pharmacists and advanced practice nurses.[28,35,36] There were 4 waves of recruitment: 3 mailed letters (including the initial invitation) and 1 telephone follow up offering the choice for an invitation to be faxed, emailed, or for the survey to be completed on the telephone. The latter step was conducted in early 2019 with all non-responders but was terminated after several hundred calls due to pharmacist nonresponse. Inclusive of all data collection waves, the study gathered data from December 2018 to May 2019.

All components of the study were approved by the University of Arizona Institutional Review Board (1910031765).

Measures

This study measured self-reported comfort with 10 harm reduction practices using the statement, "I am *comfortable* with the following pharmacy practices:" and the response options "Agree," "No opinion," and "Disagree." Because the emphasis was on affirmative indication of comfort, "Agree" was set as the reference response and other responses were collapsed into "Did Not Agree." Harm reduction items included 6 statements about consultation practices, including patient consultation about safe syringe use, safe syringe disposal, safer sex practices, need for naloxone, opioid misuse reduction, and PrEP for HIV prevention. Items also included 3 statements about dispensing practices, including dispensing naloxone for overdose reversal, PrEP for HIV prevention, and syringes for non-prescription injection drug use. Finally, 1 item mentioned referral to community services. These items were previously used in Meyerson et al. (2020).[36]

Other measures included pharmacy type (chain, independent, mass merchandiser, food store), rurality (rural or urban per the USDA rural and urban commuting area codes[37]), pharmacist gender identity, whether the responding pharmacist had personally dispensed syringes for non-prescription injection drug use in the past 2 years, and pharmacist expertise. The latter variable was measured using the statement, "Please indicate any specialization and/or continuing medical education received in the last 2 years: (select all that apply)" with the options "HIV management," "motivational interviewing," "opioid use disorder," "pain management," "PrEP," "sexually transmitted infections," "other," and "none."

Data Analyses

Latent class analysis was conducted using PROC LCA in SAS 9.4 to determine whether groups of pharmacists could be identified based on their responses to questions about their comfort with harm reduction practices. Determination of the number of classes was based on inspection of likelihood ratio G^2, -2 log likelihood, Akaike information criterion (AIC), CAIC, Bayesian information criterion (BIC), adjusted BIC, entropy, and the significance of the bootstrap likelihood ratio test (BLRT) comparing *k* and *k-1* classes for 2, 3, 4, and 5 classes with *B*=399 separate random datasets,[38] with the BLRT being weighted most significantly alongside logical interpretability.[39]

Next, tests of independence between pharmacist latent classes and variables that were theorized to be associated with comfort with harm reduction behaviors were computed using two-tailed Fisher's exact tests by using FISHER within the PROC FREQ command in SAS 9.4. This test was selected because the small size of some classes was likely to result in cross tabulated cells with expected frequencies lower than five.[40] Since this study was intended to be hypothesis-generating, alpha levels were not adjusted for multiple comparisons, but results were interpreted considering the heightened possibility of Type I error. Finally, tests of independence between having personally dispensed syringes for non-prescription drug use and the same variables, plus harm reduction latent class, were also computed using Fisher's exact tests with the same parameters.

RESULTS

Response Rate

A total of 119 managing pharmacists completed the survey, of whom 111 provided fully complete data (a response rate of 13.7%). This rate is consistent with or higher than most recent surveys of Arizona pharmacists, about which we elaborate in the Limitations section.

Descriptive Statistics

Most (94.6%) respondents managed community pharmacies that were located in urban areas, a rate similar to the 2013 distribution reported by the Arizona State Board of Pharmacy (92.6%).[41] The prevalence of independent pharmacies relative to all community pharmacies in our study was approximately 4% lower than the statewide distribution in that report.[41] Additional data are available in Table 1.

Latent Class Analysis

Table 2 shows the model fit statistics for two through five latent classes. There is no single standardized metric for selecting the correct number of classes, but considerable guidance has been published.[42]

In reviewing the fit statistics, most metrics improved through the fifth class, but the four-class model had an inflection point for AIC, and it was also the first point where the BLRT was nonsignificant. In addition, the five-class model included an extremely small class (1.80% membership probability) with no practical interpretability. Thus, the four-class solution was selected for analysis (see Table 3). Following this selection, a new variable ("best") was created that assigned a value between 1 and 4 to each participant based on the class for which their fit was the best. These distributions are shown in the "Total" row in Table 4.

- *Class 1 (37.35%, "Moderate Comfort")* was one of the two largest latent classes. Members had a high probability of expressing comfort providing most harm reduction services – except those that were linked to sexual behavior or syringe access.

Specifically, they were less likely to be comfortable consulting about safe sex or PrEP, dispensing syringes for non-prescription drug use, and dispensing PrEP.

- *Class 2 (6.31%, "Opioid Prevention Only")* was the smallest latent class, and members typically had the lowest probability of being comfortable with many of the harm reduction behaviors about which the survey inquired. Notably, however, behaviors that were conceptually related to the opioid overdose epidemic (consulting about syringe disposal, consulting about naloxone, consulting about opioid misuse, and dispensing naloxone) were exceptions.

Class 3 (43.82%, "High Comfort") was one of the two largest latent classes, and members were likely to be comfortable with most harm reduction behaviors (likelihood ratios were higher than 0.91 for each behavior except for dispensing syringes for non-prescription drug use).

Class 4 (12.18%, "Clinical Comfort") was one of the smaller latent classes. Members were generally likely to be comfortable with harm reduction practices that involved instructions, direction, or action in their role as a pharmacist (e.g., consulting about syringe use, dispensing naloxone, referral to community services). However, they were less likely to be comfortable consulting about certain behaviors (safe sex, reducing opioid misuse, and using PrEP).

Associations with Latent Class

There was some evidence that reporting PrEP expertise may not be independent (p=.010) from pharmacist latent class (see Table 4). Specifically, of 15 pharmacists who reported PrEP expertise, 12 were sorted into the *High Comfort* class. There were also several non-significant crosstabulations for gender (p=.074), reporting HIV expertise (p=.082), and reporting opioid expertise (p=.097) that may merit reexamination with a larger sample.

Associations with Self-Reported Syringe Dispensing Behavior

Analyses also suggested that pharmacy type and having personally dispensed syringes were likely not independent from one another (p<.001) (see Table 5). There was substantial variability among pharmacy types at which managing pharmacists reported having dispensed syringes (58.3% of chain pharmacies, 27.9% of food pharmacies, 75% of mass merchandiser pharmacies, and 8.3% of independent pharmacies), though some subsamples were quite small (e.g., 8 or 12 pharmacies). However, no other tests were significant.

Prior literature has suggested that comfort with dispensing syringes would be associated with dispensing syringes, so we were somewhat surprised by the apparent lack of association between comfort latent class and dispensing behavior (*p*=.901). Thus, we ran one unplanned supplemental comparison between dispensing behavior and the single comfort item for dispensing syringes to likely non-prescription drug users (see below the bolded horizontal line in Table 5) – those variables did not appear to be independent (*p*=.002), with only 27.3% of those who weren't comfortable having actually dispensed syringes, compared to 57.1% of those who were comfortable.

DISCUSSION

Our results present a somewhat complex picture that raises the possibility that comfort with harm reduction behaviors may cluster among pharmacists. However, when it comes to actually performing a behavior like dispensing syringes, the salient component of comfortability may be comfort with that specific behavior (e.g., dispensing syringes) rather than comfort with harm reduction more broadly. Further, there was some evidence that self-reported expertise in specific harm reduction approaches (e.g., PrEP) may be associated with overall comfort with harm reduction (i.e., latent class), but the measure of expertise used in this study subsumed a wide range of training and so should be interpreted cautiously (see Limitations).

We also observed an association between pharmacy type and syringe dispensing behavior. Such a relationship is likely nuanced; for example, a recent Kentucky study found that reported barriers to selling syringes without a prescription varied by pharmacy type (e.g., workflow issues in independent pharmacies versus concerns about clientele in chain or food store pharmacies).[43] Prior research has also suggested that store policy and customer demand[27] can affect syringe sales.

Importantly, this was an exploratory, cross-sectional study. Though we present some implications for practice below, our ideas in this manuscript should only be considered in light of all available evidence. We encourage replication, potentially experimentally, among a larger sample of community pharmacists to disambiguate how pharmacies might best support harm reduction practices.

Latent Classes

In addressing our first study aim, we identified four distinct latent classes of community managing pharmacists based on their comfort with 10 different harm reduction practices. Most participants were best classified into the moderate comfort (class 1) and high comfort (class 3) classes. Interestingly, there was no latent class of pharmacists that was completely uncomfortable with harm reduction, and pharmacists in all classes were generally (> 0.70 LR) comfortable with consulting about naloxone and dispensing naloxone. This study cannot determine why that might be the case, but research investigating the impact of heightened national awareness of naloxone (such as the Surgeon General's advisory[44]) on pharmacists' comfort with naloxone-related behaviors would potentially be informative.

In addition, different latent classes formed around the "topic" of the harm reduction behavior (e.g., sexual health, opioid use disorder) as well as the "method" (e.g., delivering a service or

providing advice versus discussing a behavior with a client). These data support the need for future research into how comfort with harm reduction clusters. For example, Class 4 had comparatively low likelihood ratios for comfort consulting about reducing opioid misuse, safe sex, and PrEP, but based on other comfort data for that class, one might reasonably speculate that discomfort may stem from perceived lack of ability or competence to address behavior change rather than discomfort with those topics of harm reduction *per se*. Conversely, members of Class 1 had low likelihood ratios for comfort consulting about PrEP and comfort dispensing PrEP, but high likelihood of being comfortable consulting about reducing opioid misuse. Here, the discomfort was more likely related to PrEP, not to consultation *per se*. This distinction matters because if we were only to measure comfort consulting about PrEP, then members of both Class 1 and Class 4 would appear unlikely to be comfortable, but the potential training or education that would support increased comfort might be quite different depending on whether the pharmacist belonged to Class 1 (perhaps benefitting from a PrEP training) or Class 4 (perhaps benefitting from a motivational interviewing training). However, we note again that we currently recommend further research in this area, not direct modification of education or post-licensure training, which would require a larger evidence basis.

Association between Expertise and Latent Class

Analyses for our second aim suggested the possibility that having a level of perceived expertise (either via specialization or continuing education) on some topics may not be independent from community managing pharmacists' overall pattern of comfort with harm reduction. Specifically, those who reported specialization or recent continuing education around PrEP were almost uniformly classified into the high comfort class (class 3) for harm reduction. This finding has several caveats, though. Since these data were cross-sectional, it remains unclear whether education or specialization around PrEP led to increased comfort with harm reduction behaviors, or whether individuals who were more comfortable with harm reduction were more

likely to seek out continuing education on PrEP. It is also possible that a more complex mediated relationship between the variables exists. Finally, given the number of comparisons in this study, this finding may have been the result of Type I error. We therefore encourage research to investigate the potential for continuing education on specific topics like PrEP to influence broader comfort with harm reduction, and in what ways that might occur.

Association between Latent Class and Syringe Dispensing

Counter to our expectations, neither recent continuing education/specialization nor harm reduction comfort latent class were associated with having personally dispensed syringes for non-prescription injection drug use. At the same time, our prior research on pharmacist comfort with harm reduction does raise the possibility that there is a complex relationship between comfort with harm reduction practices and behavioral performance.[12,27,28] When we conducted an unplanned analysis that included the individual item measuring comfort with dispensing syringes, it was associated with having dispensed syringes.

Limitations

The response rate for this study (13.7%) was lower than would be preferred for inference beyond the study sample itself. To some degree, this was counterbalanced by the use of a census procedure (e.g., the data represent that percentage of all community managing pharmacists in the state). In addition, recent studies of Arizona pharmacists are few in number and have reported similar or lower survey response rates among this population.[41,45-47] Thus, it may be the case that Arizona community pharmacists are difficult to survey, in general. However, this also suggests that results may be more pertinent to Arizona pharmacists, and that similar work would need to be completed among a national sample to determine whether a similar class structure or other findings would be observed more broadly.

Another limitation of this study is the relatively small sample size for latent class analysis. It may have been possible to identify additional classes with a larger sample size. Though our results generally align with previous studies on harm reduction and community pharmacies, this provides additional impetus for a larger study. We also note that the questions used to measure pharmacist expertise potentially captured a wide range of training and skills, from having recently completed a short webinar to having specialist certification (e.g., HIV Expert through the American Academy of HIV Medicine). In future studies, associations between expertise and comfort with harm reduction may be more clearly elucidated by measuring the degree of pharmacist expertise. Finally, as with all self-report questionnaires, some of the interpretability of this study relies on a shared understanding of concepts among participants completing the survey, though our questionnaire has been pilot tested and fielded in other studies, so it is reasonable to assume some level of axiomatic understanding.

CONCLUSION

The identification of four distinct latent classes of community managing pharmacists provides potentially valuable information for supporting pharmacists' harm reduction practices. As articulated earlier in the Discussion, simply observing a lack of comfort in a single area, like consulting about PrEP, may not be sufficient to understand the ways in which performance of the desired harm reduction behavior might be supported, whether through education, policy, or other means. While this was a preliminary study, the differentiation between comfort with a *topic* and comfort with an *approach* may be a meaningful way in which to determine what kinds of education and training can best support pharmacists.

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Table 1 Arizona Pharmacists Responding to Survey (N=111), 2019

Variable	N(%)
Pharmacy Type	
Chain	48 (43.2%)
Food	43 (38.7%)
Mass Merchandiser	8 (7.2%)
Independent	12 (10.8%)
Gender	
Male	69 (62.1%)
Female	42 (37.8%)
Rurality	
Rural	6 (5.4%)
Urban	105 (94.6%)
Pharmacist Expertise (Specialization or Recent CE)	
HIV Expertise	16 (14.4%)
Opioid Expertise	33 (29.7%)
PrEP Expertise	15 (13.5%)
STI Expertise	11 (9.9%)
Pain Management Expertise	35 (31.5%)
Motivational Interviewing Expertise	10 (9.0%)
Personally Dispensed Syringes	
Yes	47 (42.3%)
No	64 (57.7%)

Table 2. LCA model fit statistics

Classes	LR G^2	-2LL	DF	AIC	BIC	CAIC	A-BIC	Entropy	p *(k-1)*
2	181.34	-425.47	1002	223.34	280.24	301.24	213.87	0.89	
3	147.76	-408.68	991	211.76	298.46	330.46	197.34	0.95	.008
4	114.52	-392.06	980	200.52	317.03	360.03	181.14	0.94	.003
5	94.61	-382.10	969	202.61	348.93	402.93	178.28	0.94	.053

Table 3. LCA class membership and likelihood ratios

Item	Class 1 (37.35%)	Class 2 (6.31%)	Class 3 (43.82%)	Class 4 (12.18%)
A - Consult Syringe Use	1.00	0.00	0.96	1.00
B - Consult Syringe Disposal	0.98	0.57	0.98	1.00
C - Consult Safe Sex	0.65	0.00	0.92	0.40
D - Consult Need Naloxone	0.95	0.71	1.00	0.86
E - Consult Reduce Opioid Misuse	1.00	0.71	1.00	0.14
F - Consult about PrEP	0.09	0.00	0.98	0.31
G - Dispensing Syringes for non-RX	0.28	0.00	0.65	0.92
H - Dispensing Naloxone	0.95	0.86	1.00	0.93
I - Dispensing PrEP	0.13	0.14	0.99	0.76
J - Referral to Community Services	0.66	0.43	0.98	0.78

Table 4. Frequencies and bivariate associations between pharmacist latent classes and continuing education and sociodemographics

Variable	Class 1 *n*	Class 2 *n*	Class 3 *n*	Class 4 *n*	*n*	*p*
TOTAL	42	7	48	14	111	-
Pharm. Type	-	-	-	-	-	.971
Chain	16	4	21	7	48	-
Food	17	2	19	5	43	-
Mass Merch	4	0	4	0	8	-
Independent	5	1	4	2	12	-
Gender	-	-	-	-	-	.074
Male	23	4	36	6	69	-
Female	19	3	12	8	42	-
RUCA	-	-	-	-	-	.393
Rural	4	0	1	1	6	-
Urban	38	7	47	13	105	-
HIV Expertise	-	-	-	-	-	.082
Yes	2	1	10	3	16	-
No	40	6	38	11	95	-
Opioid Expertise	-	-	-	-	-	.097
Yes	7	3	18	5	33	-
No	35	4	30	9	78	-
PrEP Expertise	-	-	-	-	-	**.010***
Yes	1	1	12	1	15	-
No	41	6	36	13	96	-
STI Expertise	-	-	-	-	-	.467
Yes	4	0	7	0	11	-
No	38	7	41	14	100	-
Pain Expertise	-	-	-	-	-	.224
Yes	9	2	20	4	35	-
No	33	5	28	10	76	-
MI Expertise	-	-	-	-	-	.251
Yes	2	0	5	3	10	-
No	40	7	43	11	101	-

*Statistically significant

Table 5. Frequencies and bivariate associations between syringe dispensing for non-prescription drug use and continuing education and sociodemographics

Variable	Not Dispensed *n* (%)	Have Dispensed *n* (%)	*n*	*p*
TOTAL	64	47	111	-
Pharm. Type	-	-	-	**<.001***
Chain	20	28	48	
Food	31	12	43	
Mass Merch	2	6	8	
Independent	11	1	12	
Gender	-	-	-	1.000
Male	40	29	69	
Female	24	18	42	
RUCA	-	-	-	.697
Rural	3	3	6	
Urban	61	44	105	
HIV Expertise	-	-	-	.788
Yes	10	6	16	
No	54	41	95	
Opioid Expertise	-	-	-	.409
Yes	17	16	33	
No	47	31	78	
PrEP Expertise	-	-	-	.166
Yes	6	9	15	
No	58	38	96	
STI Expertise	-	-	-	.350
Yes	8	3	11	
No	56	44	100	
Pain Expertise	-	-	-	.412
Yes	18	17	35	
No	46	30	76	
MI Expertise	-	-	-	1.000
Yes	6	4	10	
No	58	43	101	
Comfort	-	-	-	.901
Class 1	23	19	42	
Class 2	5	2	7	
Class 3	28	20	48	
Class 4	8	6	14	
Dispensing Comfort	-	-	111	**.002***
Agree	24	32	56	
	40	15	55	

*Statistically significant