

Health Authority Pharmacists' Perceptions of Independent Pharmacist Prescribing

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ABSTRACT

Background: In many jurisdictions, the pharmacist's role continues to evolve from drug distribution-based service delivery to expanded scopes of practice, including independent prescribing of medications.

Objectives: To assess health authority-based pharmacists' attitudes, beliefs, and perceptions about independent prescribing, to determine how independent prescribing may affect their behaviour, and to identify perceived barriers and enablers to incorporating it into their practice.

Methods: An anonymous, cross-sectional online survey of 677 health authority-based pharmacists employed by Lower Mainland Pharmacy Services in British Columbia collected information in the following domains: demographic characteristics; attitudes, beliefs, and perceptions regarding pharmacist prescribing; anticipated effect of pharmacist prescribing on behaviour; likelihood of applying for this authority, if granted; and barriers and enablers to applying for prescribing authority and incorporating prescribing into their practice. A multivariate regression analysis was performed.

Results: A total of 266 pharmacists (39.3%) responded to the survey. Most respondents agreed that prescribing is important to the profession and relevant to their practice, and that it might enhance job satisfaction. Additionally, respondents agreed that they had the expertise to prescribe. Respondents perceived prescribing as having the potential to positively affect behaviour, including deprescribing, prescribing at time of discharge or transfer, and renewing medications. Enablers to applying for pharmacist prescribing authority included perceived positive impact on patient care and the profession, level of support from management and coworkers, and personal ability. No barriers were identified. About two-thirds of pharmacists indicated they would likely apply for prescribing authority if it were granted through legislation. Pharmacists with a clinical practice or research role were significantly more likely to apply to be a prescriber, whereas those with more than 10 years of experience were less likely to apply.

Conclusions: In this study, health authority-based pharmacists held positive attitudes and beliefs about the value and impact of independent prescribing of medications on their practice and the profession. There were no perceived barriers to applying for prescribing authority or to incorporating prescribing into practice.

Keywords: pharmacists, pharmacy, drug prescriptions, health services, pharmacy research

RÉSUMÉ

Contexte : Dans bien des provinces, le rôle du pharmacien ne cesse d'évoluer, depuis la prestation de services fondée sur la distribution de médicaments à des champs de pratique élargis, comprenant le droit de prescription autonome des médicaments.

Objectifs : Évaluer les attitudes, les croyances et les opinions des pharmaciens rattachés à des régies de santé concernant le droit de prescription autonome, déterminer l'influence de ce droit sur leurs habitudes et recenser les éléments qui, selon eux, entravent ou facilitent l'intégration de ce droit dans leur pratique.

Méthodes : Une enquête transversale anonyme en ligne s'adressant à 677 pharmaciens rattachés à une régie de santé et employés par les services de pharmacie des basses-terres continentales en Colombie-Britannique a permis de recueillir de l'information sur les domaines suivants : caractéristiques démographiques; attitudes, croyances et opinions concernant le droit de prescrire des médicaments; effets envisagés sur les habitudes du droit de prescrire accordé aux pharmaciens; probabilité de demander ce droit, s'il existe; et les éléments entravant ou facilitant la demande du droit de prescrire et l'intégration de ce droit dans leur pratique. Une analyse de régression multivariée a été réalisée.

Résultats : Au total, 266 pharmaciens (39,3 %) ont répondu au sondage. La plupart d'entre eux ont affirmé que le droit de prescrire est important pour la profession et pertinent dans le cadre de leur pratique et que cet acte pourrait accroître leur satisfaction au travail. De plus, les répondants affirmaient qu'ils possédaient l'expertise requise pour prescrire. Selon eux, le droit de prescrire pouvait influencer positivement leurs habitudes, notamment en ce qui concerne l'interruption de la prescription, la prescription au moment du congé ou d'un transfert et le renouvellement de médicaments. Parmi les éléments incitant les pharmaciens à solliciter le droit de prescrire, on comptait les effets positifs présumés sur les soins offerts aux patients et sur la profession, le soutien de la part de la direction et des collègues et les capacités personnelles. Aucun obstacle n'a été recensé. Environ deux tiers des pharmaciens ont indiqué qu'ils solliciteraient probablement le droit de prescrire s'il était accordé par la loi. Les pharmaciens en pratique clinique et ceux en recherche étaient beaucoup plus enclins à faire la demande pour devenir prescripteurs alors que ceux comptabilisant plus de dix ans d'expérience étaient moins enclins à faire la demande.

Conclusions : Dans la présente étude, les pharmaciens rattachés à une régie de santé affichaient une attitude et des croyances positives à propos de la valeur du droit de prescription autonome des médicaments et des effets qu'il aurait sur leur pratique et la profession. On n'a recensé aucun élément perçu comme un obstacle à la formulation d'une demande du droit de prescrire ou à l'inclusion de ce rôle dans la pratique.

Mots clés : pharmaciens, pharmacie, prescriptions de médicaments, services de santé, recherche en pharmacie

INTRODUCTION

Health care delivery models around the world are continuously evolving to better meet patients' needs. One example is the expansion of medication prescribing authority to nonphysician care providers, including pharmacists, nurses, and naturopathic physicians.¹⁻¹⁶ In many jurisdictions, the role of the pharmacist continues to evolve from drug distribution-based service delivery to expanded scopes of practice, including independent prescribing of medications.¹⁻¹⁶ In the United Kingdom, independent prescribing by pharmacists was introduced in 2006.¹⁴ In 2013, prescribing rights were granted to New Zealand pharmacists who had completed a postgraduate pharmacist prescribing course.¹⁵ Prescribing authority for Canadian pharmacists varies across the country, according to provincial legislation. For example, pharmacists in the province of Alberta may apply for and be granted "additional prescribing authorization", which allows them to independently initiate, continue, or adjust any prescription medication, with the exception of narcotics and controlled substances.¹⁶ Studies have shown that patients cared for by Alberta pharmacists with additional prescribing authorization, as compared with control patients receiving usual care, experienced improved outcomes in terms of hypertension, dyslipidemia, overall cardiovascular risk, and diabetes mellitus.¹⁷⁻²⁰ A recent issue of the *American Journal of Health-System Pharmacy* focused on pharmacist prescribing across the United States and Canada.¹⁻¹³ This issue highlighted a variety of models for pharmacist prescribing, primarily through collaborative drug therapy agreements in both inpatient hospital and ambulatory clinic (e.g., stroke, cancer pain) settings, which have led to improvements in medication utilization, as well as clinical and cost outcomes.^{2,5-10} Additionally, Gray and Mysak¹⁰ described the implementation of a framework aimed at supporting Alberta health authority-based pharmacists with additional prescribing authorization who practise in collaborative settings, and the intention to make this authorization a standard expectation.

Although initiatives are under way to implement independent prescribing of medications by pharmacists in many jurisdictions in Canada, to date there have been no published assessments of health authority-based pharmacists' perceptions of independent prescribing in British Columbia. Health authority-

based pharmacists primarily provide care to patients who have been admitted to hospital or are under the care of a specialty ambulatory clinic affiliated with a hospital. The objective of this study was to evaluate health authority-based pharmacists' attitudes, beliefs, and perceptions of how independent prescribing could affect their practice, to identify anticipated enablers of and barriers to incorporating independent prescribing into their practice, and to identify their intentions to apply for such authority, if granted.

METHODS

Study Design and Context

A cross-sectional observational study was conducted utilizing an anonymous survey of health authority pharmacists employed by Lower Mainland Pharmacy Services (LMPS) in British Columbia, Canada. This organization provides pharmacy services to 31 sites, including 24 acute care hospitals, in and around Greater Vancouver and the Fraser Valley. At the time of the study, independent pharmacist prescribing was not permitted through legislation in the study jurisdiction. However, health authority pharmacists in this jurisdiction had the authority to modify, continue, or substitute medications in specific situations—for example, adjusting a medication dose on the basis of laboratory values (e.g., renal function, international normalized ratio) or serum drug concentrations, continuing certain medications that a patient was taking before admission, or substituting a drug within the same therapeutic class. The study was approved by the Behavioural Research Ethics Board at the University of British Columbia and the Research Ethics Board at Fraser Health.

Survey Instrument

The anonymous online questionnaire was developed utilizing published studies of pharmacist prescribing surveys^{16,21} and the investigators' expertise. The questionnaire was piloted for clarity, comprehensiveness, and data interpretability through testing with a non-probability sample of 12 health authority-based and community-based pharmacists, none of whom participated in the final survey. Minor feedback received from these individuals was incorporated to improve the clarity of the survey. Prescribing was

defined as the independent writing and signing of a prescription or medication order with or without involvement of another health care professional in reaching the decision to prescribe (excluding cases of cosigning or verbal orders), based on the definition used by Heck and colleagues.¹⁶

The questionnaire collected information in the following domains: demographic characteristics, attitudes and beliefs regarding independent pharmacist prescribing, anticipated effect of independent pharmacist prescribing on respondents' behaviour, respondents' likelihood of applying for independent pharmacist prescribing authority if granted, and barriers and enablers to applying for independent pharmacist prescribing and incorporating it into practice. The survey tool was administered by FluidSurveys and hosted by the University of British Columbia. The survey was open for a 4-week period in February and March 2017. A copy of the survey instrument is included as Appendix 1 (available at <https://www.cjhp-online.ca/index.php/cjhp/issue/view/190/showToc>).

Study Population

All 680 pharmacists employed by LMPS were eligible to complete the study. Potential participants were identified from e-mail distribution lists for LMPS employee pharmacists. The study involved complete sampling and was not hypothesis-driven, so no sample size calculation was performed. Consent was implied by survey participation, and all responses were kept confidential. No incentives to participate were offered to study participants. The invitation to participate in the study was distributed by personal e-mail, with weekly reminders sent to invitees who had not yet completed the survey.

Data Synthesis

Different scales were used to capture respondents' perceptions of independent pharmacist prescribing. Attitudes and beliefs were assessed by means of 12 statements with responses on a 5-point agreement scale (1 = not at all, 2 = slightly, 3 = somewhat, 4 = moderately, and 5 = strongly). Because the data analysis was based not on the level of agreement (e.g., slightly versus strongly), but rather on whether or not there was agreement with each statement, a post hoc decision was made to classify the response "not at all" as "disagree", and all other responses as "agree", as a means of facilitating data analysis.

Barriers and enablers to incorporating independent pharmacist prescribing into practice were rated on a 9-point scale (from 1 = significant barrier to 9 = significant enabler). Factors with ratings less than 5 were considered "barriers", those with ratings greater than 5 were considered "enablers", and those with a rating of exactly 5 were considered to be neither barriers nor enablers. To facilitate data analysis, perceptions of the potential effects on prescribing behaviour in the context of selected activities were grouped and recoded into categories of "affecting" and "not

affecting" behaviour. Pharmacists' intention to apply for independent prescribing authority was assessed on a 4-point scale (1 = not at all, 2 = slightly likely, 3 = moderately likely, and 4 = very likely); to facilitate data analysis, the "not at all" responses were classified as "not likely", and all other responses were classified as "likely".

Data Analysis

Descriptive statistics were used to report frequencies, measures of central tendency, and dispersion of results. Forward multiple logistic regression was used to identify respondents' characteristics that were predictive of their attitudes and beliefs toward independent pharmacist prescribing, their intention to apply for independent pharmacist prescribing, and their perception of the effect of independent pharmacist prescribing on their behaviour. The responses to questions in each of these 3 sections were dichotomized as described in the section "Data Synthesis". An independent regression analysis was performed for each question. In each regression analysis, the dichotomized answers to the question represented the dependent variable, and participant characteristics were independent variables. A bivariate analysis was conducted for respondent characteristics (sex, years of experience, level of education, primary practice area, hospital type) and participants' dichotomized responses to the questions to identify relationships between them. The groupings for primary area of practice were based on the investigators' clinical experience and knowledge of these positions in the health authority environment where the study was conducted.

Variables significant at $p < 0.05$ were considered covariates in the multivariate regression models. An adjusted odds ratio (OR), 95% confidence interval (CI), and corresponding p value were computed with binomial distribution and logit link functions. Whenever a variable had more than 1 option or level (e.g., the 5 levels for the variable primary practice site: tertiary care hospital, community hospital, tertiary and community hospitals, other, and would rather not say), each level was treated independently. For example, the OR reported for tertiary care hospital represents the odds that practising in a tertiary care hospital affected the dependent variable relative to not practising in a tertiary care hospital. However, in the case of education, a bachelor's degree in pharmacy was chosen as the reference category, and the odds for other education levels were compared with the odds for a bachelor's degree. Microsoft Excel 2010 (Microsoft Corporation, Redmond, Washington) and IBM SPSS Statistics version 22 (IBM, Armonk, New York) were used for the analyses.

RESULTS

Of the 680 potentially eligible pharmacists, 3 were excluded because of their involvement in the study as investigators; therefore 677 pharmacists were invited to complete the survey. Of

these, 266 responded (response rate 39.3%). The characteristics of respondents are shown in Table 1.

Attitudes and Beliefs about Independent Prescribing

Respondents' attitudes toward and beliefs about independent pharmacist prescribing are presented in Table 2. Most respondents (> 90%) agreed that independent prescribing is important to the profession and relevant to their practice, and that they had the clinical expertise to prescribe. Multiple logistic regression identified participant characteristics that contributed to pharmacists' attitudes toward and beliefs about independent prescribing (Table 2).

Anticipated Effect of Independent Prescribing on Behaviour

Table 3 summarizes data concerning respondents' perceptions of how their behaviour in various scenarios would be affected if they had independent prescribing authority. The behaviours most likely to be affected were deprescribing (77.8%), prescribing on discharge (72.2%), prescribing on patient transfer (67.7%), and renewing medications (66.9%). Multiple logistic regression identified various pharmacist characteristics that contributed to perceptions about how independent prescribing would affect behaviour (Table 3).

Barriers and Enablers

Pharmacists indicated the degree to which they perceived 7 factors as potential barriers to or enablers of their decision to apply for independent prescribing authority and incorporate it into their practice (Figure 1). None of the factors were perceived as barriers. The strongest enablers were perceived impact on the profession (median 8, interquartile range 6–9) and impact on patient care (median 8, interquartile range 6–9).

Intention to Apply for Independent Prescribing Authority

Most pharmacists indicated that they would be moderately likely (28.4% [66/232]) or very likely (37.5% [87/232]) to apply for independent prescribing authority if it were to be granted. Pharmacists with a clinical practice or research role were significantly more likely to apply for independent prescribing authority (OR 3.53 [95% CI 1.57–7.94] and OR 2.58 [95% CI 1.20–5.55], respectively) if it were to be granted. Pharmacists with more than 10 years of experience (relative to those with up to 10 years of experience) were significantly less likely to apply for independent prescribing authority (OR 0.50 [95% CI 0.27–0.95]).

DISCUSSION

This was the first survey to characterize British Columbia health authority-based pharmacists' perceptions of independent

Table 1. Characteristics of Survey Respondents

Characteristic	No. (%) of Respondents*
Sex, female (n = 266)	179 (67.3)
Age group (years) (n = 263)	
20–29	65 (24.7)
30–39	85 (32.3)
40–49	59 (22.4)
>50	54 (20.5)
Professional experience ≤ 10 years (n = 266)	146 (54.9)
Highest level of education (n = 263)	
Accredited Canadian Pharmacy Residency	113 (43.0)
Bachelor of Science in Pharmacy	69 (26.2)
Postgraduate Doctor of Pharmacy	64 (24.3)
Entry-Level Doctor of Pharmacy	6 (2.3)
Master of Science in Pharmacy	6 (2.3)
Other	4 (1.5)
Would rather not say	1 (0.4)
Involved in providing direct patient care* (n = 266)	232 (87.2)
Role† (n = 263)	
Clinical practice	216 (82.1)
Teaching	144 (54.8)
Dispensary/drug distribution	143 (54.4)
Research	72 (27.4)
Support‡	41 (15.6)
Clinical leadership/management	37 (14.1)
Administrative leadership/management	32 (12.2)
Primary practice site (n = 263)	
Tertiary care hospital	141 (53.6)
Community hospital	62 (23.6)
Tertiary care and community hospital	24 (9.1)
Other	21 (8.0)
Would rather not say	15 (5.7)
Primary areas of practice‡ (n = 263)	
General§	141 (53.6)
Specialty**	97 (36.9)
Support‡	73 (27.8)
Critical care or emergency medicine	38 (14.4)
Pediatrics, neonatal medicine, or maternal fetal medicine	25 (9.5)
Psychiatry or mental health/addiction	11 (4.2)

*Defined as working directly with patients to prevent, identify, and resolve drug-related issues.

†Respondents were allowed to select multiple options, if applicable, so the sum of percentages is greater than 100.

‡Defined as antimicrobial stewardship, drug distribution, home parenteral therapy, medication management, medication reconciliation, medication safety, medication use evaluation, or pharmacokinetics.

§Defined as ambulatory outpatient clinic, general medicine, geriatric medicine, medication management, medication reconciliation, rural medicine, surgery, or women's health.

**Defined as anticoagulation management, cystic fibrosis/respirology, cardiology, infectious diseases, leukemia/bone marrow transplant, maternal/fetal medicine, mental health/addiction, nephrology, neurology, oncology, palliative care, psychiatry, rehabilitation, solid organ transplant, or toxicology.

pharmacist prescribing and how it might relate to pharmacy practice.

Overall, pharmacists felt that independent prescribing was relevant to their practice and important to the profession.

Table 2. Survey Respondents' Attitudes and Beliefs about Independent Pharmacist Prescribing

Question	Median Response* (IQR)	Agreement† (%)	Covariate	OR‡ (95% CI)	p Value
Do you feel it is important for the profession of pharmacy to have independent pharmacist prescribing?	5 (4–5)	96.4	Role: clinical leadership/management	0.20 (0.05–0.78)	0.021
Do you feel that independent prescribing authority is relevant to your practice?	5 (4–5)	90.4	Role: clinical practice	4.22 (1.66–10.74)	0.002
Do you feel that you require additional training to take on a prescribing role?	3 (2–4)	62.5	Education: ACPR	0.36 (0.15–0.88)	0.025
			Education: postgraduate PharmD	0.05 (0.02–0.14)	<0.001
			Primary area of practice: support	2.38 (1.19–4.78)	0.014
			Role: clinical practice	0.22 (0.08–0.62)	0.004
Do you feel that you have the clinical expertise to be an independent pharmacist prescriber?	4 (3–5)	91.2	Involved in providing direct patient care	6.34 (2.20–18.24)	0.001
			Role: teaching	9.58 (2.08–43.99)	0.004
Do you have the time to incorporate prescribing activities into your practice?	4 (3–5)	85.3	Role: clinical practice	11.80 (4.67–29.79)	<0.001
			Education: other	0.06 (0.01–0.51)	0.011
			Education: entry-level PharmD	0.11 (0.02–0.81)	0.030
Do you feel that having independent prescribing authority would decrease efficiency in your practice?	1 (1–2)	12.4	Role: administrative leadership/management	0.11 (0.01–0.90)	0.040
			Role: clinical practice	0.19 (0.07–0.49)	0.001
Do you feel that having independent prescribing authority would increase efficiency in your practice?	3 (3–5)	85.7	Experience: > 10 years	0.35 (0.16–0.78)	0.010
Do you feel that independent pharmacist prescribing will enhance job satisfaction?	4 (3–5)	88.8	No significant covariates		
Are you concerned about the increased responsibility associated with prescribing?	3 (2–4)	59.8	Primary area of practice: support	1.99 (1.07–3.69)	0.030
			Role: clinical leadership/management	0.43 (0.21–0.91)	0.027
Are you concerned about increased liability associated with prescribing?	3 (2–4)	68.5	Role: clinical leadership/management	0.21 (0.10–0.45)	<0.001
Do you feel having prescribing authority would reduce the amount of time spent contacting physicians and leaving suggestions?	4 (3–5)	86.9	Primary area of practice: specialty	3.03 (1.16–7.87)	0.027
			Primary area of practice: critical care	0.35 (0.14–0.86)	0.015
Do you feel your communication with physicians would be more frequent if you had independent pharmacist prescribing?	2 (1–3)	45.0	No significant covariates		
Do you feel communication with physicians would be improved/more effective if you had independent pharmacist prescribing?	3 (2–4)	63.7	No significant covariates		

ACPR = Accredited Canadian Pharmacy Residency, CI = confidence interval, IQR = interquartile range, OR = odds ratio, PharmD = Doctor of Pharmacy.

*Possible responses: 1 = not at all, 2 = slightly, 3 = somewhat, 4 = moderately, 5 = strongly.

†The response "not at all" was classified as "disagree"; all other responses were classified as "agree".

‡An OR > 1 indicates that the presence of the covariate was associated with a higher likelihood of agreement with the statement.

An OR < 1 indicates that the presence of the covariate was associated with a lower likelihood of agreement with the statement.

Independent pharmacist prescribing was also perceived to have the potential to increase efficiency in practice and enhance job satisfaction. Pharmacists with a clinical practice role were significantly more likely to consider independent prescribing to be relevant to their practice, whereas those with a clinical leadership or management role were less likely to consider it important to the profession. It is difficult to understand why pharmacists with a clinical leadership or management role would be less likely to consider independent prescribing important to the profession.

One possibility is that, unlike the pharmacists reporting to them, these organizational leaders believe that pharmacists are maximally effective without the authority to prescribe. Those with residency or postgraduate Doctor of Pharmacy training, as well as those with a clinical practice role, were less likely to believe that they required additional training for independent prescribing. These results are likely reflective of their increased confidence as practitioners. Pharmacists without these credentials were more likely to believe that they required additional training.

Table 3 (Part 1 of 2). Respondents' Perceptions of the Effect of Independent Pharmacist Prescribing on Their Own Behaviour

Activity*	Response; % of Respondents			Covariate†	OR (95% CI)‡	p Value
	Would not affect behaviour (already have this authority)	Would not affect behaviour (other reasons)	Would affect behaviour (would be helpful and enable me to more easily accomplish this for my patients)			
Prescribe medications the patient was taking before hospital admission during medication reconciliation	21.7	16.1	62.1	Education: ACPR	0.37 (0.17–0.81)	0.012
				Education: postgraduate PharmD	0.23 (0.10–0.53)	0.001
Prescribe medications as part of medication reconciliation during patient transfer	14.9	17.3	67.7	Primary area of practice: specialty	0.52 (0.29–0.95)	0.033
				Role: dispensary/drug distribution	2.37 (1.31–4.32)	0.005
Prescribe discharge medications	4.0	23.7	72.2	Role: administrative leadership/management	4.00 (1.16–13.81)	0.028
				Role: clinical practice	3.64 (1.51–8.79)	0.004
				Role: dispensary/drug distribution	3.78 (1.96–7.28)	<0.001
Prescribe an adjusted dose of medication based on laboratory values and clinical assessment	27.7	8.4	64.1	Involved in providing direct patient care	4.52 (1.62–12.59)	0.004
				Role: research	0.46 (0.25–0.86)	0.015
				Role: administrative leadership/management	5.14 (1.44–18.40)	0.012
Prescribe an adjusted dose of medication based only on laboratory values	45.4	8.8	46.0	Education: entry-level PharmD	0.08 (0.01–0.78)	0.030
				Education: residency	0.27 (0.13–0.55)	<0.001
				Education: postgraduate PharmD	0.44 (0.20–0.94)	0.035
				Primary area of practice: pediatrics	5.19 (1.76–15.29)	0.003
				Primary area of practice: general	1.82 (1.03–3.21)	0.038
Prescribe new medications for an inpatient	2.4	34.9	62.7	Role: clinical practice	2.37 (1.14–4.96)	0.021
				Primary area of practice: specialty	3.44 (1.95–6.07)	<0.001
Prescribe new medications for an outpatient	1.2	53.8	45.2	Primary area of practice: support	0.48 (0.26–0.89)	0.020
				Role: administrative leadership/management	3.89 (1.13–13.45)	0.032
Renew medications	12.9	20.1	66.9	Experience: > 10 years	0.40 (0.19–0.84)	0.015
Perform deprescribing	5.2	16.9	77.8	Primary area of practice: critical care	0.41 (0.18–0.97)	0.043
				Role: administrative leadership/management	8.23 (1.62–41.82)	0.011
				Role: clinical practice	3.92 (1.57–9.79)	0.003
				Role: dispensary/drug distribution	0.40 (0.19–0.84)	0.016

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Table 3 (Part 2 of 2). Respondents' Perceptions of the Effect of Independent Pharmacist Prescribing on Their Own Behaviour

Activity*	Response; % of Respondents			Covariate†	OR (95% CI)‡	p Value
	Would not affect behaviour (already have this authority)	Would not affect behaviour (other reasons)	Would affect behaviour (would be helpful and enable me to more easily accomplish this for my patients)			
Prescribe over-the-counter medications	45.0	12.0	43.0	Primary area of practice: pediatrics	4.51 (1.69–12.03)	0.003
				Role: teaching	0.58 (0.33–0.998)	0.049
Prescribe a medication without prior discussion with a physician or team	3.2	49.2	47.6	Role: administrative leadership/management	3.03 (1.05–8.76)	0.041
				Role: clinical practice	4.61 (1.82–11.68)	0.001
Prescribe a medication with prior discussion with a physician or team	27.8	8.1	64.1	Education: entry-level PharmD	0.14 (0.02–0.97)	0.046
				Education: postgraduate PharmD	0.32 (0.14–0.76)	0.009
				Primary area of practice: pediatrics	5.04 (1.40–18.14)	0.013
				Site: non-tertiary care hospital	5.18 (1.31–20.43)	0.019

ACPR = Accredited Canadian Pharmacy Residency, CI = confidence interval, OR = odds ratio, PharmD = Doctor of Pharmacy.
 *Activities in relation to the following question: If you were a pharmacist with independent prescribing authority, how would that affect your prescribing behaviour in each of the following activities?
 †The analysis was performed by dichotomizing the responses into “affecting” versus “not affecting” behaviour.
 ‡An OR > 1 indicates that the presence of the covariate was associated with a higher likelihood of perceiving independent pharmacist prescribing as helpful for the behaviour. An OR < 1 indicates that the presence of the covariate was associated with a lower likelihood of perceiving independent pharmacist prescribing as helpful for the behaviour.

Respondents identified many activities in which independent pharmacist prescribing might positively affect their behaviour, including deprescribing, performing medication reconciliation (prescribing on discharge, admission, or transfer), and renewing medications. These results demonstrate that pharmacists may be recognizing an unmet need not addressed by the current system. About half of respondents stated that independent pharmacist prescribing would not change their behaviour with respect to prescribing without prior discussion with a physician or the health care team. This result indicates that pharmacists may prefer to prescribe in a collaborative health care team environment, which is consistent with data from Alberta, where pharmacists were 3 times more likely to use their prescribing authority after an interdisciplinary health care team discussion than to prescribe without prior team discussion.¹⁶

The strongest enablers for incorporating independent pharmacist prescribing into practice were perceived positive impacts on the profession and on patient care. Other factors, such as support from management and coworkers, competence, and self-confidence, were all perceived to be enablers rather than barriers. These results agree with a recent study of pharmacists in Nova Scotia, in which knowledge, reinforcement, and intentions

were positively associated with self-reported prescribing activity.²² In one previous study, dynamics within the interdisciplinary health care team, self-confidence, competence, level of management support, and perceived impact on work environment were identified as barriers to pharmacist prescribing,¹⁶ but the current study did not confirm these findings. Rather, none of the factors listed in the survey were identified as perceived barriers to incorporating independent prescribing into practice.

These results should be interpreted in light of the study limitations. Given the topic area for this survey study, the 39.3% response rate introduces potential for unknown biases in the results, particularly positivity bias. Also, the study involved pharmacists from a single health authority in a mostly urban area, which may limit the generalizability of the results to rural or other jurisdictions. Also, independent pharmacist prescribing is not yet legislated in the study jurisdiction, and the attitudes, beliefs, perceptions, and intentions of the respondents could change over time, depending on the structure of the authority, if it is eventually granted. This study did not assess all of the possible barriers and enablers to applying for and incorporating independent pharmacist prescribing into practice. Instead, 12 potential barriers and enablers to incorporating pharmacist prescribing into practice

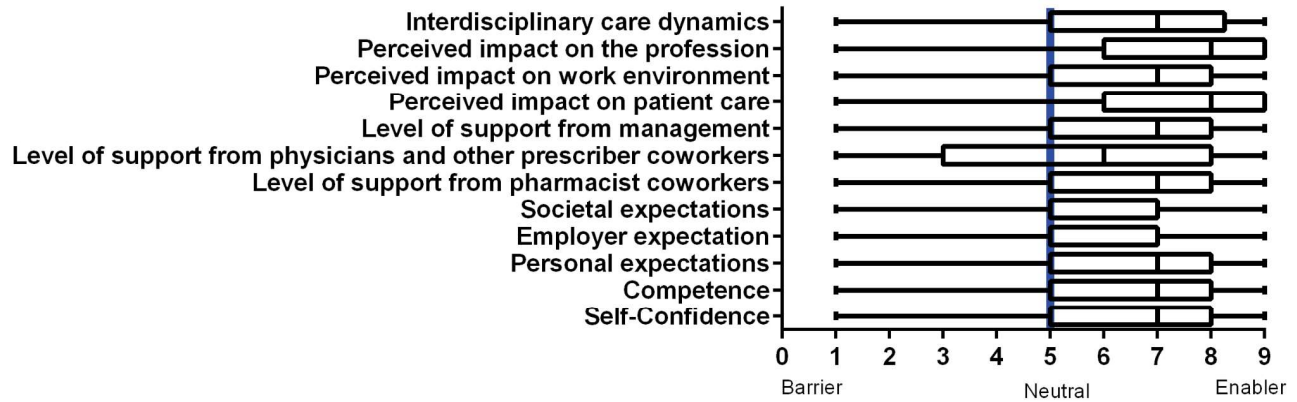


Figure 1. Perceived barriers to and enablers of incorporating independent pharmacist prescribing into practice. Factors were rated on a scale from 1 to 9, where 1 = significant barrier to 9 = significant enabler, and the single horizontal lines indicate the potential range of response for each factor. Data are presented as medians with interquartile ranges; for both societal expectations and employer expectations, the median value was 5.

were included, as were 7 potential barriers and enablers to applying for prescribing authority, based on previously published research in this area.^{16,21} Lastly, potential additional training requirements or costs associated with attaining independent prescribing authority were not investigated, so the results may overestimate the likelihood of pharmacists pursuing this authorization.

CONCLUSION

Health authority-based pharmacists who participated in this study held positive attitudes and beliefs about the value and impact of independent prescribing on their practice and the profession. Medication reconciliation, deprescribing, medication renewal, and collaborative prescribing were anticipated to be particularly enhanced by independent pharmacist prescribing. Respondents did not perceive any of the factors listed in the survey as barriers to applying for independent prescribing or incorporating it into their practice. Most respondents were moderately or very likely to apply for independent prescribing authority if it were to become available, particularly those with direct patient care or research roles, as well as those newer to practice (≤ 10 years of experience).

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