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With pharmacists expanding their scope of practice to help patients optimize their drug therapy, we aimed to gather and compare the preferences of pharmacists and physicians on medication management services provided by pharmacists. The findings of this survey help provide better understanding of physicians' attitudes and will help pharmacists navigate collaborations with physicians on caring for mutual patients.

Étant donné que les pharmaciens élargissent leur champ d'exercice pour aider les patients à optimiser leurs traitements médicamenteux, notre objectif était de réunir et de comparer les préférences des pharmaciens et des médecins en matière de services de gestion de la pharmacothérapie offerts par les pharmaciens. Les résultats de cette étude permettront de mieux comprendre les attitudes des médecins et aideront les pharmaciens à s'y retrouver dans leurs collaborations avec les médecins pour les soins offerts à leurs patients respectifs.

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Opinions and preferences of British Columbia pharmacists and physicians on medication management services

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ABSTRACT

Background: Medication management (MM) services are being provided by pharmacists across Canada in various forms, but pharmacist-physician collaboration is still not a routine practice in most jurisdictions. This survey aimed to gather pharmacists' and physicians' opinions and preferences for MM provision.

Methods: Two parallel, cross-sectional online surveys, including best-worst scaling tasks, were designed for pharmacists and physicians in British Columbia to capture and compare their preferences for a number of attributes of MM.

Results: Surveys were completed by 119 pharmacists and 146 physicians. Results indicate that pharmacists and physicians had similar opinions on many aspects of MM. Ninety-five percent of pharmacists and 69% of physicians believed that

additional health services are needed to help patients optimize the use of their medications. However, the majority of each group felt that they were the most important health care professional in providing this service. Most pharmacists (79%) and some physicians (25%) thought that optimizing use of medications would result in both decreased costs and utilization to the health care system. Both pharmacists and physicians felt that the best attribute of an MM service would be if the services resulted in improved health and medication use for patients. Both groups were motivated by increased remuneration for MM; however, the relative strength of preference for this was higher among physicians. Interestingly, physicians valued improved medication adherence as a result of MM more highly than pharmacists did.

Discussion and Conclusion: Most pharmacists and physicians agreed that improving patients' health and medication use would be the best attribute of MM and that there is a need for such services. However, physicians also had strong preferences for being remunerated for participating in MM provision. *Can Pharm J (Ott)* 2017;150:42-51.

Background

The transition from a distribution-focused pharmacy practice to one that is clinically oriented has been supported in Canada by a number of

new pharmacy services in the past several years.¹ Medication management (MM) by pharmacists is defined broadly as all professional activities that a pharmacist delivers to optimize drug therapy

outcomes for patients.² The benefits of pharmacist-led MM in Canada have been demonstrated for various disease states such as knee osteoarthritis,^{3,4} asthma,⁵ hypercholesterolemia⁶ and diabetes.⁷ Because of these demonstrated positive effects, the British Columbia (BC) Ministry of Health in conjunction with the BC Pharmacy Association introduced a pilot MM program in September 2010.⁸ Now in BC, pharmacists are able to provide and be remunerated for medication review services, prescription adaptations and administration of immunizations. Currently, a medication review session for a patient in BC who is taking at least 5 medications is reimbursed by the government at \$60, and if 1 or more drug therapy problems are identified and action is taken for resolution, remuneration is \$70. Follow-up sessions are remunerated at \$15. Patients can receive 1 medication review every 6 months and up to 4 follow-ups every 12 months.⁹

With the changing landscape of pharmacy services across Canada,¹ it is vital to understand the perspectives and opinions of other stakeholder groups in the primary care ecosystem, including physicians, pharmacists and patients. As demonstrated by an earlier province-wide survey, patients were very satisfied with pharmacist-led MM, citing benefits including an improved understanding of their medications and more reassurance about their therapies, although public awareness regarding the skills and knowledge of pharmacists as medication experts could still be improved.¹⁰ Surveys showed that physicians and pharmacists are also in agreement that collaborative practice can result in improved patient outcomes; however, collaborative care is still not a routine practice in most jurisdictions.¹¹⁻¹³ As such, the objective of this study was to characterize the preferences of pharmacists and physicians in BC on the provision of pharmacist-led MM.

Methods

Study design

We conducted a cross-sectional online survey to understand the opinions and preferences of pharmacists and physicians with respect to MM services provided by pharmacists in BC. The University of BC Behavioural Research Ethics Board approved this study (H11-03382).

Population

Pharmacists registered with the College of Pharmacists of BC and family physicians registered

KNOWLEDGE INTO PRACTICE

- Pharmacists and physicians were in agreement that medication management (MM) services can help improve patients' health and medication use.
- Physicians would be most satisfied with MM if the service resulted in patients taking their medications properly or resulted in increased adherence.
- Physicians felt that the worst attribute of an MM service would be if it resulted in a worsened physician-patient relationship.
- Forty-one percent of physicians preferred to collaborate with pharmacists by phone or in person, and 40% preferred fax or email.

with the College of Physicians and Surgeons of BC were contacted for participation from November to December 2013. Pharmacist contact was initiated via email, while physicians were recruited using CRC Research, a public market research firm. Each participant was sent an initial letter of information about the survey and a link to the online survey. When respondents accessed the survey online, they were directed to the consent page. After providing consent, each participant answered the online survey, and responses were captured anonymously in a secure database. Pharmacists who completed the surveys were entered into a draw for an Apple Inc. iPad prize, while physicians were reimbursed \$75 by cheque from CRC Research.

Surveys

Two parallel surveys were designed to capture the main themes and attributes of MM: 1 for pharmacists and 1 for physicians.¹⁴ The 2 surveys had different questions based on the results of focus groups.¹⁴ The surveys also included sociodemographic, open-ended and multiple-choice questions to help capture the full array of opinions and preferences. The surveys can be found in Appendix 1 and 2 (available online at cph.sagepub.com/supplemental).

Best-worst scaling

Both surveys also contained a type of choice experiment called best-worst scaling (BWS)¹⁵ to capture the preferences of pharmacists and physicians on various attributes of MM provision. Through focus groups, 5 different attributes about MM were found to be important to pharmacists and physicians. These included varying levels of reimbursement for MM, time required to provide MM, the impact of MM

MISE EN PRATIQUE DES CONNAISSANCES

- Les pharmaciens et les médecins se sont accordés pour dire que les services de gestion de la pharmacothérapie peuvent améliorer la santé des patients et leur prise de médicaments.
- Les médecins seraient davantage satisfaits des services de gestion de la pharmacothérapie s'ils avaient pour résultats que les patients prennent leurs médicaments correctement ou permettaient d'améliorer l'observance.
- Les médecins ont trouvé que le pire aspect des services de gestion de la pharmacothérapie serait qu'ils entraînent une détérioration de la relation entre le médecin et le patient.
- 41 % des médecins ont indiqué préférer collaborer avec les pharmaciens par téléphone ou en personne, et 40 % par télécopieur ou par courriel.

on patients' health and the impact on relationships with other health care providers. The final number of attribute levels to be presented to respondents was 14 for each group. Respondents were presented these attributes in a choice set consisting of 4 attributes per set and were asked to indicate the best (most preferred) and worst (least preferred) attributes, leaving 2 attributes unselected. When a respondent chose a best and worst attribute in a choice set, it indicated that the difference in preference between these 2 items for that individual was the greatest among any of the other possible pairs. After repeated individual best-worst selections within varying choice sets, a ranking of items revealed the preferences of all respondents for each MM attribute. A total of 13 different choice sets were presented, which resulted in 12 possible pairs of attributes for selection. A final ranking of the 14 attributes levels were calculated for each respondent.

Analysis

All sociodemographic and multiple-choice responses were analyzed using frequencies and means where appropriate. To capture the heterogeneity of the responses, mixed multinomial logistic regression was used to estimate the relative importance of each MM attribute from the BWS task, using the least preferred attribute as the reference. The relative preferences for each attribute are represented by regression coefficients (β). Detailed methodology on the analysis of BWS responses is discussed elsewhere.¹⁶ SAS statistical software version 9.2 (SAS Institute Inc., Cary, NC) was used to perform all analyses.

Results

Pharmacist demographics

A total of 119 pharmacists out of 1264 contacted completed the survey (response rate of 9.4%). A summary of the respondents' demographic information is presented in Table 1. The majority of pharmacists were female (56%), had a baccalaureate degree in pharmacy as their highest level of education (74%) and were staff pharmacists (54%). Almost two-thirds had completed a methadone training program (67%) and certification for immunizations (66%). On average, respondents had been licensed pharmacists for 18 years (SD = 12.5 years) and were 43 years old (SD = 12 years).

Pharmacist attitudes and opinions on MM

Fifty-seven percent of respondents indicated that they had participated in the BC MM Project.¹⁷ When asked on a scale of 0 to 100 how comfortable they feel about performing MM, the average rating was 80 (range from 7 to 100). Nineteen (16%) indicated that they were completely comfortable (100 out of 100) in performing MM services. Reasons for a lack of comfort with MM provision included time constraints, lack of access to information, challenges with the documentation or paperwork and not having enough knowledge in certain disease areas.

Eighty-three percent of respondents were interested in receiving certification related to MM services, while 17% were not interested. Forty percent of pharmacy respondents felt that recertification for MM should occur every 5 years, while 36% felt that no recertification should be required. Remaining respondents preferred recertification to be every 3 years (14%), every 7 years (6%) or every 2 years (3%). Of the 83% who were interested, 56% said their company already pays for training, and the remaining 44% were willing to pay out of pocket. The average amount pharmacists were willing to pay was \$238 (SD \$270) per certification.

Pharmacists were asked which aspects of their current pharmacy workflow they would be willing to adjust to accommodate the provision of MM. Sixty-six percent were willing to increase staffing of pharmacists, 46% would increase staffing of regulated technicians, 44% would increase the responsibility of technicians for distribution-related activities, 35% would

TABLE 1 Pharmacist demographics

Demographics	Frequency (n = 119)	Percentage
Sex		
Male	52	44
Female	67	56
Age, mean (SD)	43 (12)	
Highest education		
Undergraduate college/university degree	88	74
Graduate or other professional degree	13	11
Residency training	17	14
Other	1	1
Number of years as a licensed pharmacist, mean (SD)	18 (12.5)	
Current position		
Staff pharmacist	64	54
Pharmacy manager	29	24
Pharmacy owner of independent store	20	17
Pharmacy owner of banner store	7	6
Other, specify	16	13
Certifications received		
Immunization competency program for BC health professionals	79	66
Methadone maintenance treatment program	80	67
Chronic disease specialty (certified diabetes educator, certified asthma educator)	12	10
Other*	10	8
Hours per year attending formal continuing pharmacy education events or Web training		
<10 hours	28	24
10 to <20 hours	41	34
20 to <30 hours	25	21
>30 hours	25	21

*ADAPT program (n = 3), compounding (n = 2), hospital pharmacy residency (n = 2), lean certification (n = 1) and sports nutrition (n = 1).

increase the staffing of pharmacy assistants, 27% would delay the speed of prescription filling and 6% would increase pharmacy hours of operation. In open-ended comments, 14% of respondents also suggested other strategies to accommodate MM provision. Examples included making appointments with patients, implementing a ratio of regulated technicians to pharmacists and performing MM at prescription intake.

Ninety-five percent of pharmacists indicated that additional health services are needed to help patients optimize the use of their medications. Of these respondents, 91% indicated that pharmacists are the most important health care professional in providing this service, whereas 8% indicated that it should be physicians and 2% indicated that it should be nurse practitioners providing MM. Overall, most pharmacists (79%) thought that optimizing use of medications

TABLE 2 Pharmacists' and physicians' opinions about medication management (MM) patient selection criteria

	Pharmacists Indicating "Yes" (%)	Physicians Indicating "Yes" (%)
1. Pharmacist selection based on specific criteria only	5	11
2. Patients request MM services based on their own needs only	3	2
3. Physicians refer patients for MM services "as-needed" only	2	25
Two of the above	13	9
Pharmacist selection + patient requests	63	15
Physicians refer + patient requests	6	31
Physicians refer + pharmacist selection	31	54
All of the above (1 + 2 + 3)	75	49
Other suggested approach*	2	3

*Other suggested approaches from pharmacists included that the service should be offered for all patients or those in home health care. From physicians, 4 of 5 other suggested approaches were that the physician should be the one doing MM and/or if the pharmacist were to do it, he or she should receive approval from the physician.

TABLE 3 Pharmacists' and physicians' opinions of the importance of medication management components

	Pharmacists Indicating "Most Important" (%)	Physicians Indicating "Most Important" (%)
Medication review services	43	40
Counseling on the selection and use of nonprescription medications	15	12
Prescription adaptations	13	8
Medication adherence services	12	34
Refusal to fill prescriptions	10	3
Administration of injections	7	2

would result in both decreased costs and utilization to the health care system, 9% felt it would result only in decreased costs and 4% felt it would result in decreased utilization only. The remainder felt that it would result in a combination of increased costs and/or increased utilization.

Table 2 outlines pharmacists' and physicians' opinions about the selection criteria to be applied when selecting which patients will receive MM, while in Table 3, perceptions of the importance of the various components of MM are documented.

With regard to access to patient information, 98% of pharmacists indicated that it would be useful to have laboratory results, 92% would like to have a list of patients' medical conditions, 91% would like to know patients' indications for medications,

87% would like to have a list of nonprescription medications and natural health products taken by patients, 84% would like to see patients' best possible medication history (BPMH), 82% would like to see allergy assessments, 80% would like to see clinical documentation from other health care providers and 71% would like to have access to patient care plans. Similarly, pharmacists felt all of this information should be available for them to learn about an MM encounter that another pharmacist performed for the patient.

BWS by pharmacists

Pharmacists felt that the worst attribute of an MM service would be if the service resulted in worsened health and medication use. This was

FIGURE 1 Best-worst scaling results for pharmacists

Inset numbers are β -coefficients from multinomial logistic regression, representing relative preferences for each attribute of medication management relative to worsened health and medication use. All $p < 0.0001$.

used as a reference level, and all other attributes were compared with this to quantify the preferences for each. As seen in Figure 1, a worsened pharmacist-physician relationship ($\beta = 1.03$, $SD = 1.67$) was the next worst attribute. Pharmacists felt that the best attribute of an MM service would be if the services resulted in improved health and medication use ($\beta = 7.99$, $SD = 5.79$). This was followed by an improved pharmacist-physician relationship ($\beta = 5.30$, $SD = 2.17$). There was significant heterogeneity in the preferences of pharmacists for whether MM improved patients' health and medication use, whether the service took 15 or 45 minutes of patient-care time, whether the service took 15 or 45 minutes of non-patient-care time and whether they were reimbursed \$120 per patient per 6 months.

Physician demographics

A total of 146 physicians responded to the survey out of the 730 contacted (response rate of 20%). A summary of the demographic information is presented in Table 4. The mean age of physician respondents was 53 years ($SD = 8.8$ years) and ranged from 33 years of age to 70 years. Most

were male (70%), family physicians (95%) and had been licensed physicians for 25 years ($SD = 9.7$ years). Ninety-one percent of physicians worked in close proximity to a pharmacy, with 61% being located within the same or an adjacent building and 3% being within the same clinic.

Physician attitudes and opinions on MM

Fifty-eight percent of physicians did not know if they had any patients who participated in the BC MM project, 23% indicated that they did have patients who participated in the BC MM Project and 19% indicated they did not. However, most physicians (64%) were aware of 1 or more of their patients receiving a medication review from a pharmacist. When asked about how they perceived pharmacist provision of MM affecting their liability, almost half (47%) felt that there was no impact on their liability as a physician, 26% felt it reduced their liability, 23% felt it increased their liability and 4% selected none of the above and indicated that it would likely depend on the specific situation.

When respondents were asked to rank the most important factor that would influence their satisfaction with MM, the highest ranked factor (36%)

TABLE 4 Physician demographics

Demographics	Frequency (n = 146)	Percentage
Sex		
Male	102	70
Female	44	30
Age, mean (SD)	53 (8.8)	
Number of years as a licensed physician, mean (SD)	25 (9.7)	
Current position		
Family physician	138	95
Specialist physician	2	1
Other	6	4

was if “the service resulted in patients taking their medications properly/increased adherence.” Other factors influencing physician satisfaction with MM included if “the service resulted in optimal use of drugs” (30%), if “physicians were also remunerated for time spent on communicating with patients/pharmacists as part of the service” (21%), if “pharmacists worked in the same office as physicians in a team-based approach” (8%) and if “the service freed up time for more complex patient management by physicians” (4%).

Sixty-nine percent of physicians indicated that they believe additional health services are needed to help patients optimize the use of their medications. Of these respondents, 60% felt that physicians are the most important health care provider in providing this service, 36% felt that it should be a pharmacist and 4% felt it should be a nurse practitioner. Twenty-five percent of physician respondents felt that optimizing use of medications would most likely result in decreased costs and utilization of the health care system, 21% felt it would result in decreased costs only and 15% felt it would result in decreased utilization only. Ten percent of physicians did not respond to this question, and the remainder felt that it would result in a combination of increased costs and/or increased utilization.

Physicians were asked, “From a clinical perspective, what data should be captured in the online information system, in addition to existing information, that would be useful for communicating the work accomplished by pharmacists to other health care practitioners and vice versa?” Eighty-four percent indicated

that they would want access to allergy assessments, 75% would like to see the BPMH, 66% would like to see a list of patients’ medical conditions, 68% would like a list of patients’ use of nonprescription medications or natural health products, 66% would like to see indications for medications prescribed, 34% would like to see patient care plans, 32% would like to see laboratory results and 29% would like to see clinical documentation from other health care providers. When asked to rank their preferred method of communication with pharmacists regarding issues found through MM, 41% preferred phone or in person conversations, 40% preferred fax or email, 15% preferred real-time electronic messages via an electronic system and 4% preferred other forms of communication.

BWS by physicians

Physicians felt that the worst attribute of an MM service would be if the service resulted in a worsened physician-patient relationship. This was used as a reference level, and all other attributes were compared with this to quantify the preferences for each. As seen in Figure 2, worsened health and medication use ($\beta = 0.33$, SD = 1.75) and no reimbursement ($\beta = 1.01$, SD = 1.42) were the next worst possible attributes or outcomes of MM services. Physicians felt that the best attribute of an MM service would be improved patient health and medication use ($\beta = 6.90$, SD = 4.52). This was followed by reimbursement of \$30 per patient ($\beta = 6.29$, SD = 4.03). Other important attributes included improved physician-patient relationship ($\beta = 5.64$, SD = 3.17). There was

FIGURE 2 Best-worst scaling results for physicians

Inset numbers are β -coefficients from mixed multinomial logistic regression, representing relative preferences for each attribute of medication management relative to worsened physician-patient relationship. All $p < 0.0001$ (except "worsened health and medication use," $p = 0.02$).

significant heterogeneity in preferences for all of the attributes except for reimbursement of \$0 for MM and impact on pharmacist-physician and physician-patient relationships.

Discussion

In this study, we characterized pharmacists' and physicians' preferences for broadly defined MM services in Canada. Almost all pharmacists and physicians agreed that there are gaps in care with regard to helping patients optimize the use of their medications. They agreed that improving patients' health and medication use would be the best attribute of MM and that within the bundle of services that encompass MM, each group valued medication reviews the most. Physicians strongly valued an improved physician-patient relationship, while pharmacists put great value on an improved pharmacist-physician relationship. Both groups were motivated by increased remuneration; however, the relative strength of preference for this was higher among physicians. Interestingly, physicians valued improved adherence as a result of MM more highly than

pharmacists did. In general, this study corroborates literature findings that physicians identified the compilation and maintenance of an accurate medication list as the greatest advantage of collaborating with community pharmacists.^{12,18,19} Other advantages included the provision of education and counselling to improve patient understanding and adherence to medications^{11,13} and the facilitation of insurance approvals.¹¹ In contrast, pharmacists have indicated that they would prefer to collaborate more on the identification and resolution of drug therapy problems.¹¹

Although our findings showed that some pharmacists and physicians agreed that MM would reduce costs and resource utilization to the health care system, the majority of both groups thought that their own profession should be the one to provide MM. The finding that physicians believed they should be the ones providing MM services is one that has been cited in other surveys in the literature.¹⁹ Interestingly, similar findings have been reported in situations in which pharmacists were practising within family practice clinics alongside

family physicians.²⁰ For example, in a report by Farrell et al.,²⁰ both physicians and pharmacists rated the other lower than they rated themselves in providing MM activities at the onset of practising with each other. Physicians preferred having pharmacists onsite when the latter was performing MM services and to have the responsibility of referring patients to pharmacists for MM.¹⁹ However, having MM service provision through a physician referral-only process would go against the preferences of patients for the ease of access of this service and, importantly, might “miss” patients who need an MM service.¹⁰ In our study, the majority of physicians were at least aware of their patients receiving medication reviews from a pharmacist, a much more positive finding than other studies that demonstrated physicians were often unaware of the provision of MM services and did not understand the role of pharmacists in providing MM.^{11,19,21,22} Other barriers to collaborative care that have been identified by both physicians and pharmacists included lack of time and compensation^{11,12} and having to interact with several different pharmacists and physicians.¹¹ Physicians expressed concern that pharmacists lack patient information such as diagnosis and laboratory test results necessary to make sound recommendations.¹² However, it appears that from our findings, some of these issues could be overcome by the adoption of an electronic health record platform accessible to both pharmacists and physicians.

This study had several strengths and some limitations. The most important strength was that it comprehensively assessed the opinions of these stakeholders toward all aspects of MM provided by pharmacists in BC (i.e., medication review services, prescription adaptation, administration of injections and others). We were the first to apply a novel approach, BWS, to quantitatively determine the preferences of pharmacists and physicians for various attributes of MM. The respondent sample

sizes were sufficient to allow for robust analysis of results, as we had over 100 respondents in each group. However, some limitations related to the recruitment methods of the respondents exist. Using CRC to recruit physician respondents, as we did, could have resulted in respondent biases. In addition, the response rate of pharmacists was low, which could have elicited responses from those who were most motivated to provide opinions about MM.

Nonetheless, the findings suggest that for greater acceptance by all stakeholders and a collaborative approach to MM, a formal referral process could be considered where physicians can refer patients to pharmacists. However, this should not be an exclusive process and patients should be permitted to self-refer and pharmacists should be allowed to auto-refer. Recently, the General Practice Services Committee revised the conference and telephone fee incentive payments to BC's family physicians in order to improve patient care.²³ Family physicians are remunerated \$40 per 15 minutes (maximum of 2 units per day and 18 units per year per patient) for collaborative conference via telephone or in person with an allied care provider such as a pharmacist.²³ Either the family physician or the pharmacist can initiate this service.²³ These solutions appear promising for a successful pharmacist-delivered MM program with the goals of improving patient outcomes and medication use.

Conclusion

The majority of pharmacists and physicians agreed that improving patients' health and medication use would be the best attribute of MM and that there is a need for such services. Both thought that MM would reduce costs and utilization to the health care system and were interested in sharing patient information electronically. However, both pharmacists and physicians thought that their own profession should provide MM. ■

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Author Contributions: All authors contributed to study design, interpreting study results, critical review of the manuscript and approval of the final version submitted for publication. N. W. Tsao contributed to the study design and was responsible for survey construction, data analysis and manuscript writing. A. Khakban was responsible for design, construction, analysis and reporting of the best-worst scaling experiment. L. Gastonguay contributed to survey construction and manuscript editing. Z. Zafari

contributed to data analysis and interpretation. L. D. Lynd and C. A. Marra conceived the study and obtained funding; posed the research question, research design and methods; and contributed to manuscript writing and revisions. C. A. Marra assumes overall responsibility for the study.

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